Post-Construction Stormwater Management

Purdue Road School

March 14, 2023

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HNTB

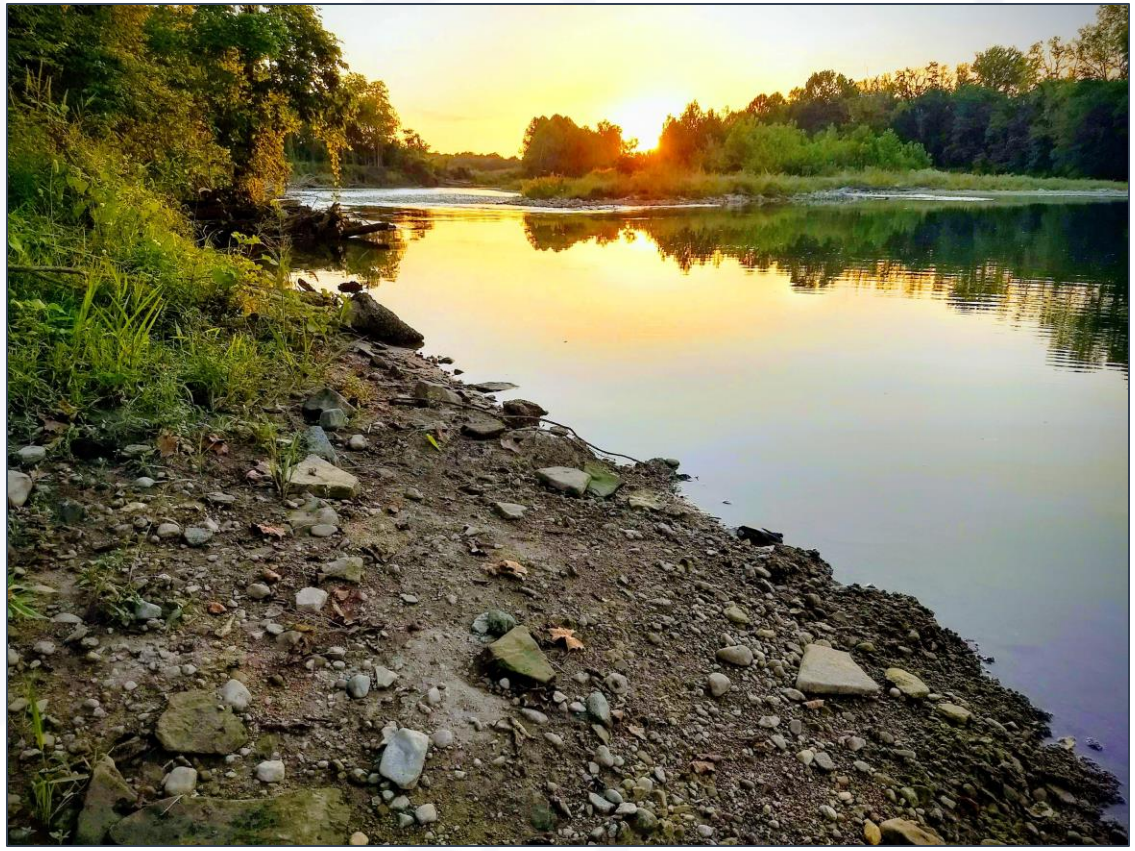
NextLevel INDIANA

Outline

- Permit Requirements
- Structural Measure Selection
- Overview and Design for each PCSM
- Maintenance Forms
- Updates to GIS Asset Management
- Examples
- Submittal Guidance
- Q&A

INDOT as an MS4

- Characteristics
  - State of Indiana
  - Linear - 11,000 centerline miles
  - 4,800 miles within another MS4
  - Buildings and grounds (rest areas, district offices, and maintenance facilities)



West Fork White River, Morgan County, Indiana

Nomenclature and Goals

Dry Grass Swale, Hendricks County, Indiana

- Best Management Practice (BMP)
  - Temporary erosion and sediment control features
- Post-construction Stormwater Management Measure (PCSM)
  - Permanent, designed features
  - Help reach water quality and quantity goals
  - May be activity based, ex. reduced chloride application for road de-icing

Target Pollutant

- Sediment
  - Most common water pollutant (US EPA)
  - Primary pollutant in stormwater run-off from pavement
  - Permanent measure target
- Design to 80 % sediment removal rate as Total Suspended Solids (TSS)
  - When 80% TSS removal is achieved, other contaminants and floatables are removed as well

Sediment-laden run-off in Marsh River (MN) – pca.state.mn.us

Why are we doing this???

It's the law!

MS4 General Permit

Construction Stormwater General Permit

CSGP (1 of 2)

- **3.2 Design Requirements** (a)(9) – Post-construction stormwater management measures
  - Control quality and quantity of runoff
  - Not exceed pre-development discharge based on 2-, 10-, and 100-year peak storm events
  - Minimize pollutants associated with stormwater run-off from final land use
  - Size to Water Quality Volume (WQv) or water quality flow rate
  - Use of one or more measures in tandem or series
  - Use of infiltration measures to minimize discharge pollutants

CSGP (2 of 2)

- **4.1 Plan Content**
  - 4.1 (a)(9) requires on all projects except those where there will be no additional impervious surfaces added (INDOT's 22-22 DM clarifies target impervious increase trigger)
  - 4.1 (a)(10) SWP3 must include
    - (A) potential pollutant sources
    - (B) 1) quality measures that target pollutants of concern, 2) minimize impacts to protected resources, 3) must be designed and approved by a trained individual, 4) selected to address pollutants of concern and reduction of peak flow, 5) active construction protective measures
    - (C) dimensions and details
    - (D) sequencing
    - (E) operations manual
    - (F) entity responsible

MS4GP

- **4.6 Post-Construction Stormwater Run-off Design and Engineering Requirements** (c)(3)
  - Infiltration measures must consider pollutants associated with run-off and potential to contaminate ground water
  - Use of alternative or pre-treatment if contamination is possible

Design Memorandum No. 22-22

- SUBJECT: Post-Construction Stormwater Management
- Design Manual Chapter 204
  - In the beginning …
  - Refers to guidance document
  - Document will expand from DM format
- Post-construction stormwater management guidance document
  - #1 Project requires CSGP = 1 acre or more land disturbance
  - #2 Added impervious area of 1 acre or more

    = 1 + 1 Rule
  - Amount of added impervious area not specified by IDEM
  - Design Manual and supporting documents = “ordinance or other regulatory mechanism”
- Applicability – INDOT projects – **NOT FOR LPA PROJECTS**

Design Memorandum No. 22-22

- Project Commitment

  Project will add approximately xxx acres of impervious surface. Designer will examine project for inclusion of post-construction stormwater management measures according to the INDOT Post-construction Stormwater Management guidance document.

- Commitment Resolution
  - See Table 1
  - Project stage as of November 18, 2022
  - Availability of qualified design measures in design
  - Availability of measures that can be modified

Table 1: Project Action

- Based on Stage as of November 18, 2022
- No action if no CSGP required
- No action if less than one acre added impervious surface
- Added impervious surface ≥ 1 acre and < 3 acres
  - Stage 3 No action
  - Stage 2 Credit
  - Stage 1 Add or modify
  - Pre PCSM required
- Added impervious surface ≥ 3 acres
  - Stage 3 Credit
  - Stage 2 Add or modify
  - Stage 1 Add or modify
  - Pre PCSM required

Table 2: Commitment Resolution

- No action

  Project was advanced past Stage X design on November 18, 2022, and it is infeasible to add post-construction stormwater management measures late in project development.

- Credit

  Project was advanced past Stage X design on November 18, 2022, and the post-construction stormwater management measures included in design are xxxx; it is infeasible to add other measures.

- Add or modify

  Project was advanced past Stage X design on November 18, 2022, and xxxx post-construction stormwater management measures were included in design, modified to meet requirements, or added. Additional measures required to meet permit requirements are infeasible because xxxx.

- PCSM required

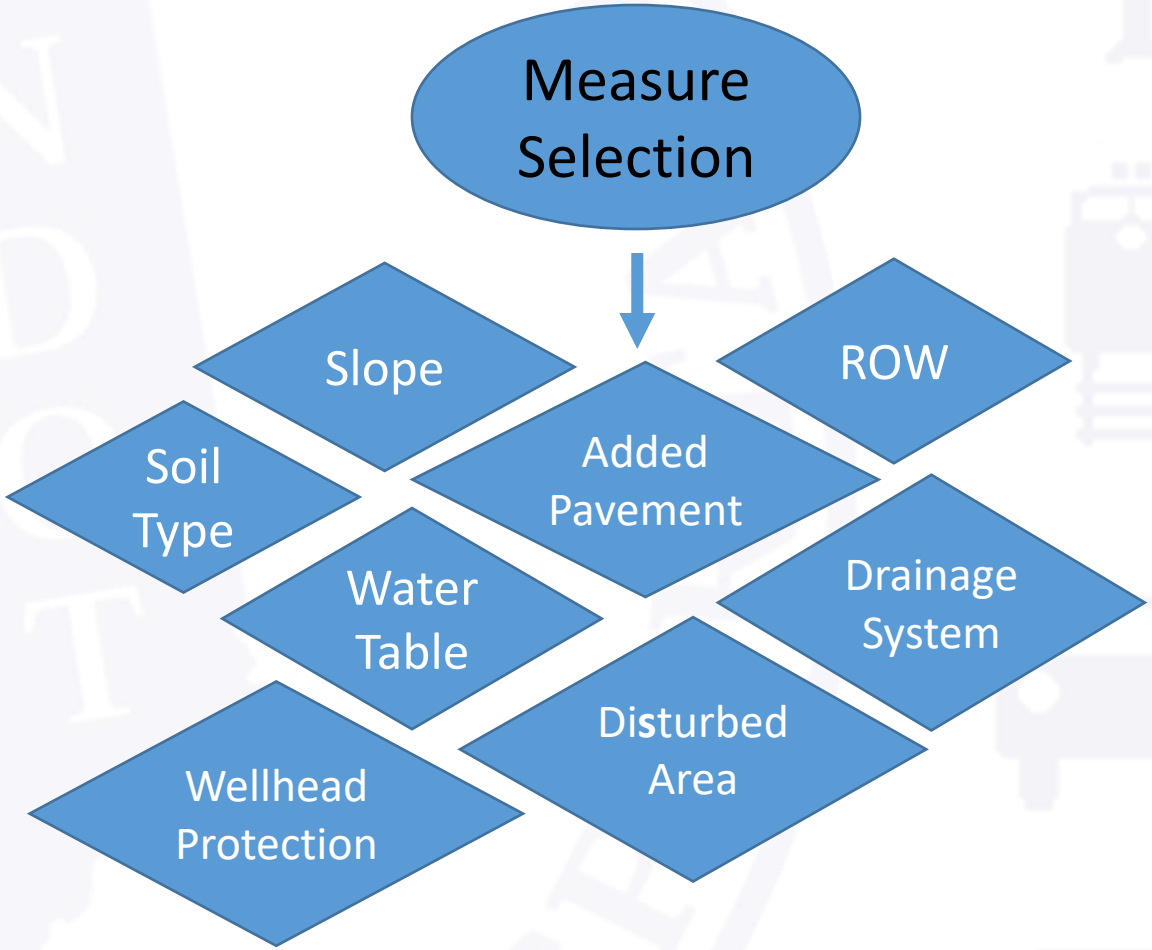
  xxxx post-construction stormwater management measures are included in the design.

NextLevel INDIANA

Measure Selection Flowchart

Considerations -

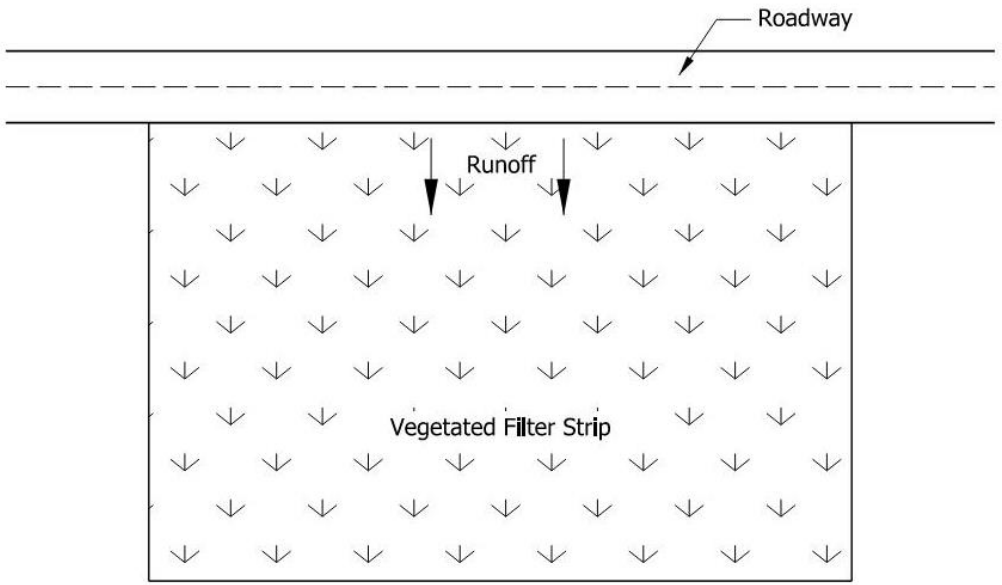
- Construction Costs
- Maintenance
- Disturbed area, added pavement
- Available ROW
- Drainage system type
- Soil type
- Water table depth
- Slope
- Wellhead protection area
- Peak flow mitigation



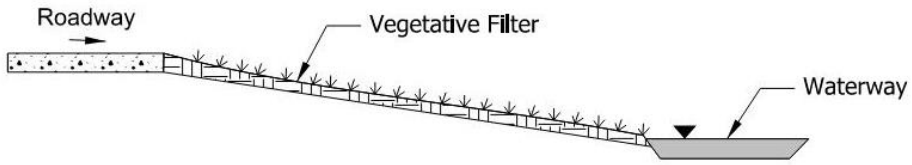
Structural Measure Selection Priority

Priority

1. Dry turf grass swale
1. Dry native grass swale
1. Filter strip
1. Dry detention
2. Wet swale
2. Wet retention pond
3. Infiltration swale
3. Infiltration basin
4. Proprietary device



Plan View



Profile View

See INDOT guidance documents for references/definitions.

Infeasibility Analysis

- Economically infeasible
  - Limited right-of-way, utility relocations, topographic constraints, and amount of added flow from offsite
  - Option to treat existing pavement instead of new added pavement in a different location within the same watershed
- TMDLs
  - Must consider receiving streams on the current 303(d) list of impaired waters
  - Pollutants not from INDOT ROW may be infeasible to remove by post-construction measures
- Documentation
  - Prior coordination with INDOT is required
  - Document decision (submit with permit application)

Hydrologic and Hydraulic Design

- Water Quality Event: A rainfall event of one inch, assumed to remove a significant percentage of pollutant from the roadway
  - Also known as the “first flush”
- Water Quality Volume: The volume of run-off generated by the Water Quality Event for treatment in PCSMs
- Water Quality Treatment Rate: The peak flow rate of stormwater run-off generated by the Water Quality Event

Rain on grass – edu.rsc.org

Water Quality Volume

$WQv = (P * Rv * A) \div 12$

Where:

WQv = water quality volume, acre-feet

P = rainfall, inches (use 1.0 inches)

Rv = volumetric run-off coefficient

A = total proposed onsite drainage area, acres

And:

$Rv = 0.05 + (0.009 * I)$

Where:

I = percent new impervious cover, %

And:

$I = [(Pia - Eia) \div A] * 100$

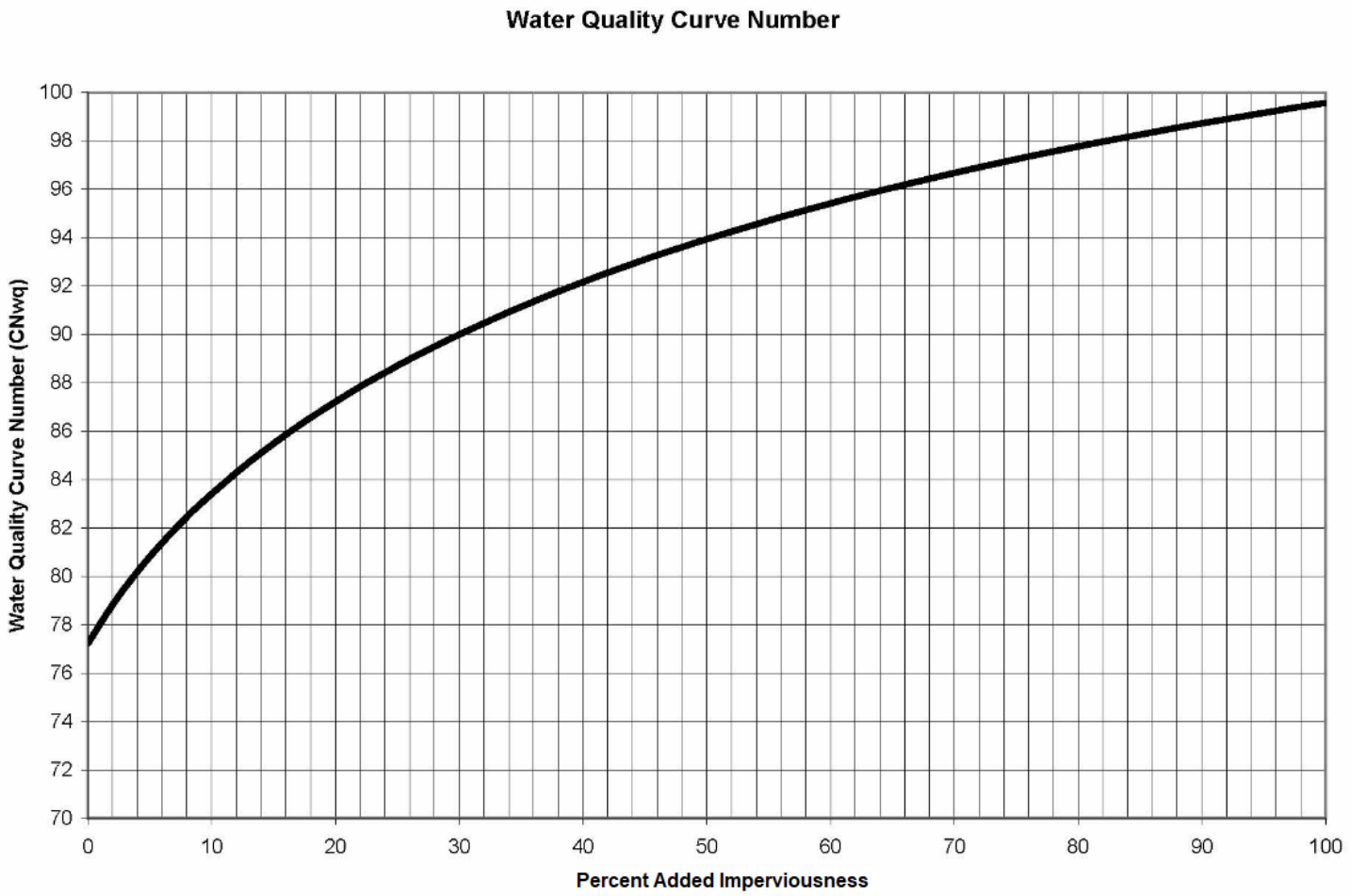
Where:

Pia = Proposed Onsite Impervious Area

Eia = Existing Onsite Impervious Area

Water Quality Treatment Rate

- Qwq
  - Calculate Tc using TR-55 methodology
  - Calculate CNwq using provided graph
  - Compute Qwq in cfs following hydrograph-oriented procedures approved in IDM Chapter 202
  - Use NRCS Type II rainfall distribution and depth of 1 inches

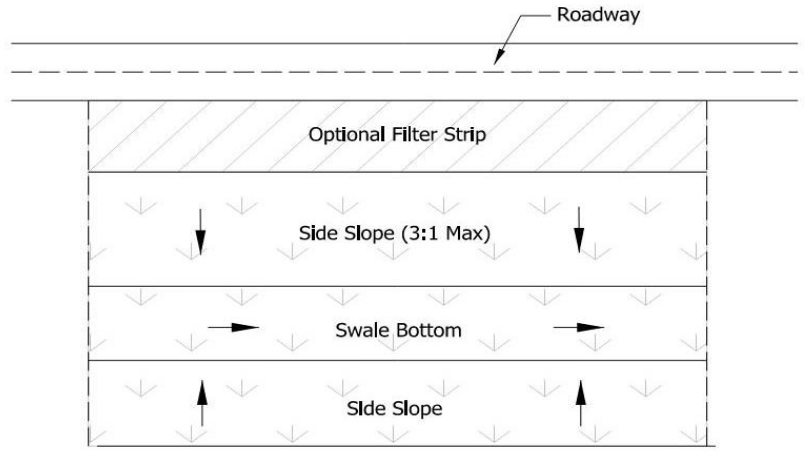


Dry Swales

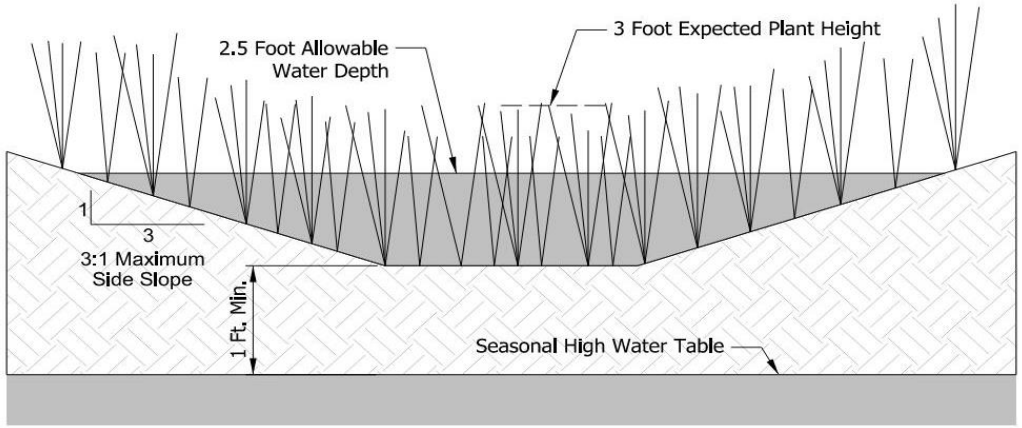
- Designed to fully drain between rainfall events
- Planted with turf grass or native grasses
- Trapezoidal, V-shaped, or natural cross section
- No underdrain
- Water depth during Water Quality Event at or below grass height (6 inches for turf, 2.5 feet for native)
- Sized using Water Quality Treatment Rate and Hydraulic Residence Time

Tahr = (Lswale ÷ vwq) ÷ 60

Where:
Tahr = hydraulic residence time, minutes
Lswale = length of swale, feet
vwq = peak flow velocity at water quality event, ft/s
Tahr of 9 minutes = 80% TSS removal



Plan View



Cross Section View

Dry Grass Swale

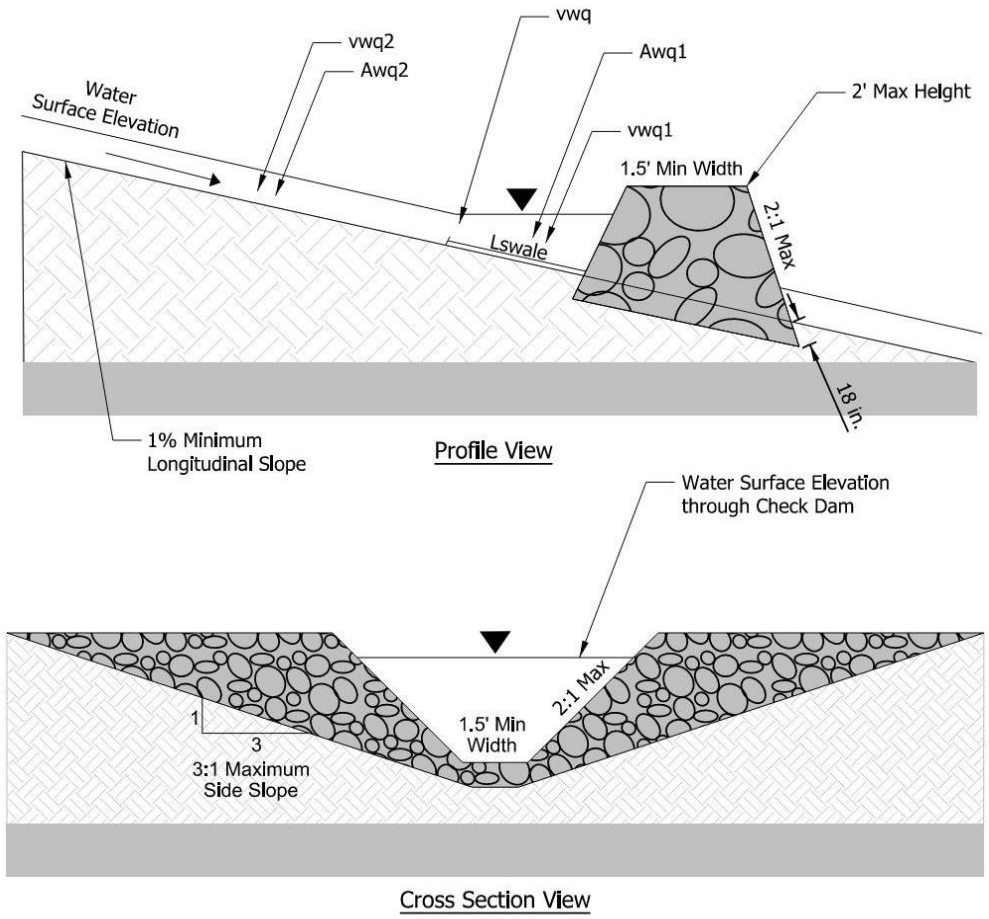
Grass Swale in I-70 Median – Maryland DOT State Highway Administration

Offsite Flow Entering a Swale

- If off-site flow cannot be bypassed it must be accounted for
- Calculations
  - Two basins are required, one for onsite and one for offsite
  - Derive Tc for both basins following typical procedures
  - CN for both basins will be derived using the same process as CNwq
    - Offsite will use percent impervious area instead of percent *added* impervious area
  - The swale is the outlet for both basins in model
  - 1 inch of rainfall
  - Typical water quality swale sizing design process

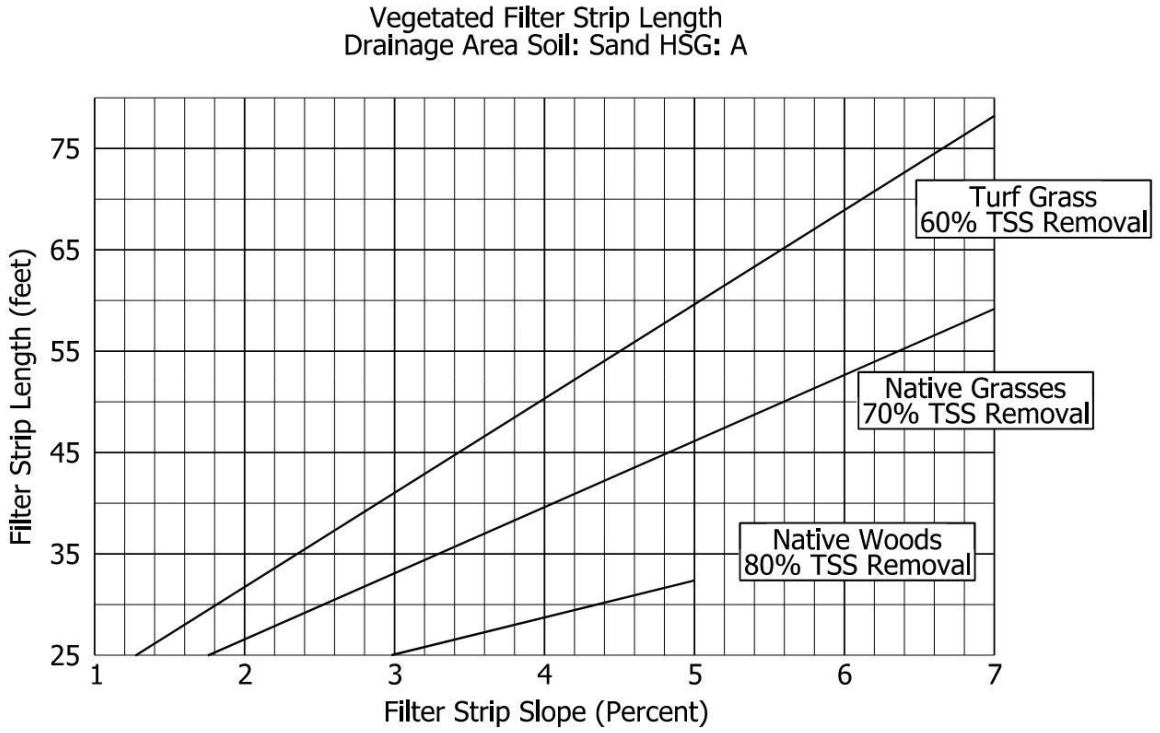
Dry Swales with Check Dams

- Only used with Native Grass Mix
- Minimum longitudinal slope of 1%
- Check dams Geometry
  - Foreslope and backslope 2:1 or flatter
  - 1.5-foot minimum width at the top
  - Trapezoidal opening minimum of 1.5 feet at the bottom, 2:1 side slopes
  - Revetment riprap, keyed in 1.5 feet below the flowline
  - Completely made of stone
  - Fully dries between rainfall events
  - Max height of 2 feet

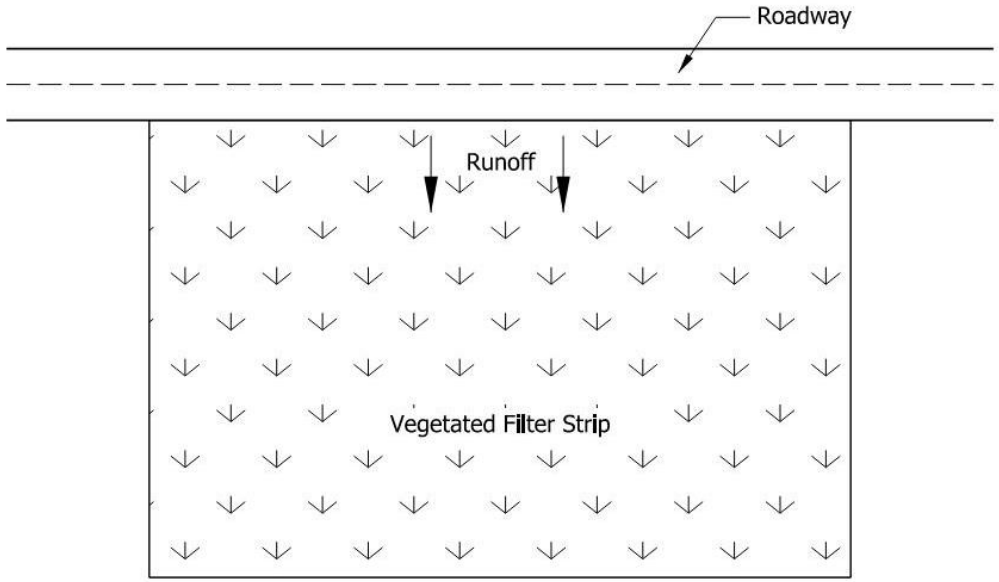


Filter Strips

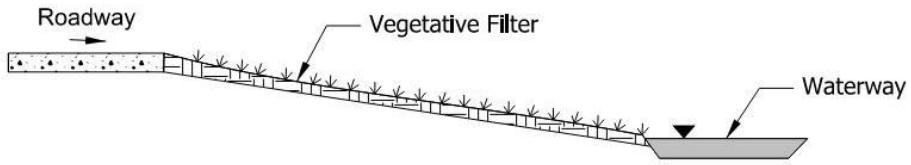
- Vegetated, uniformly graded area
  - Planted with turf grass or native grasses
  - Can utilize existing native woods
- Typically located between roadway and another PCSM or waterbody
- Effectiveness for TSS removal controlled by underlaying soil, type of vegetation, and cross-sectional slope
- Run-off sheet flows through the vegetation



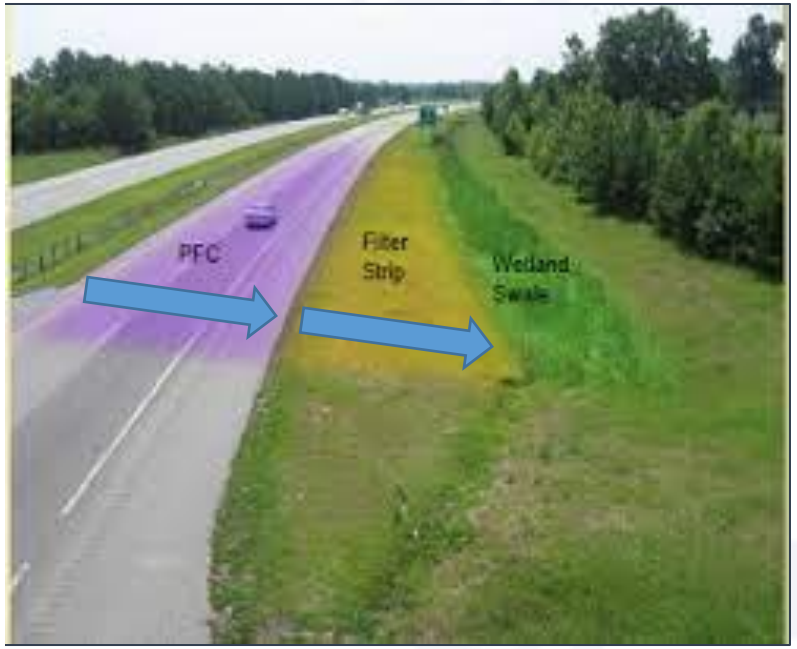
Filter Strip Examples



Plan View



Profile View

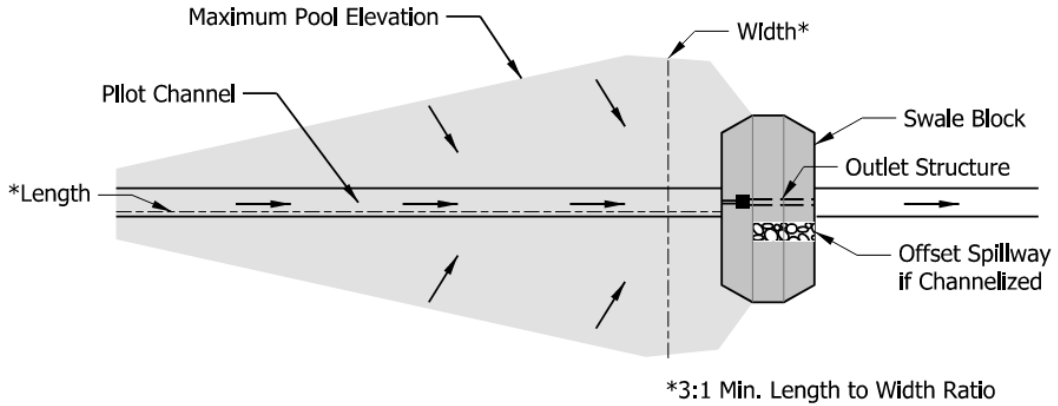


Vegetated Filter Strip – dot.state.oh.us

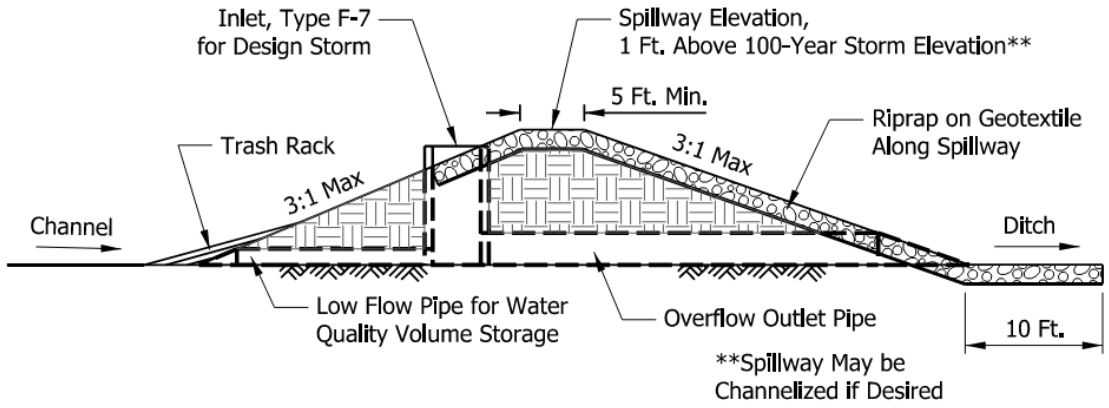
Dry Detention Ponds

- Capture and temporarily detain stormwater run-off
- Can be a peak flow mitigation PCSM as well as water quality PCSM
- 2 design options for TSS removal
- First option – model as a basin
  - Detain and release Water Quality Volume over 24 hours
  - If outlet pipe D is 10 inches or less, 50 feet of perforated pipe installed in stone trench and connected to outlet structure
  - Include a cleanout port at upstream end of perforated pipe
- Second option – model as a swale
  - Construct a meandering pilot channel
  - Design using Water Quality Treatment Rate
  - Depth of flow in channel during water quality event at or below the grass height
  - Follow design process in dry swale section

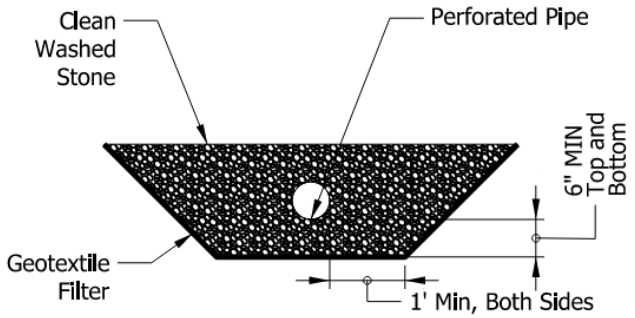
Detention Pond Detail



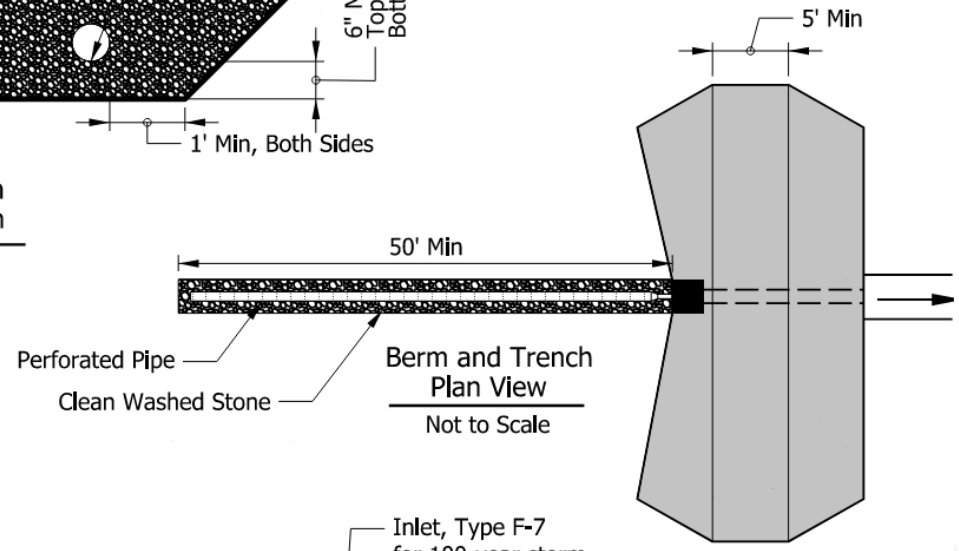
Plan View
Not to Scale



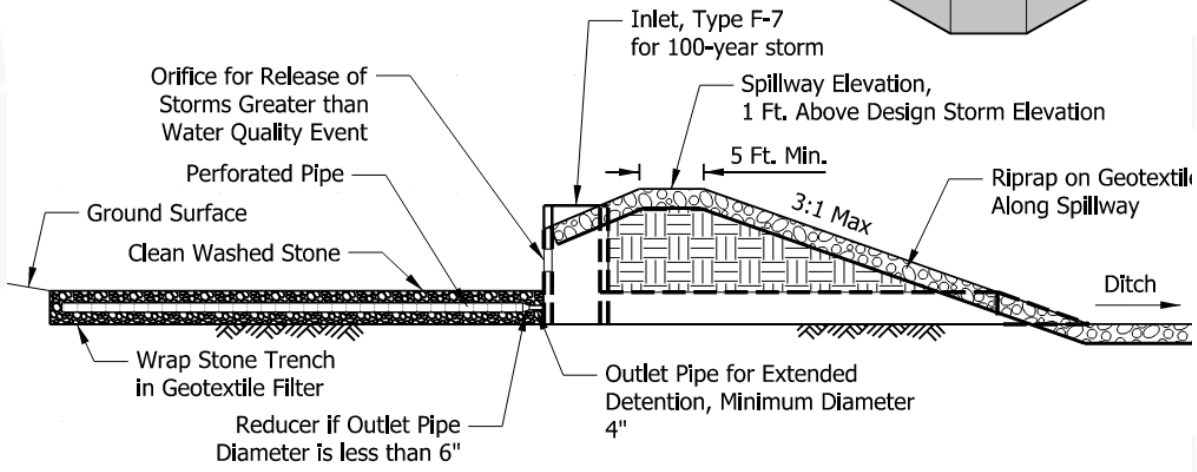
Detention Berm Cross Section



Stone Trench
Cross Section
Not to Scale



Berm and Trench
Plan View
Not to Scale

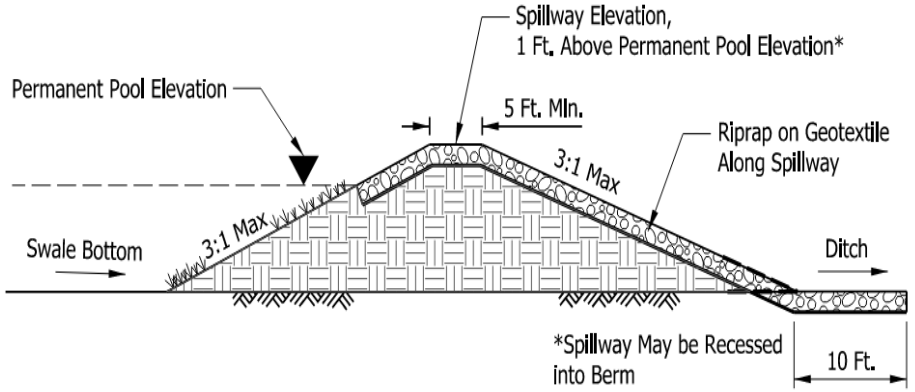


Detention Berm Cross Section

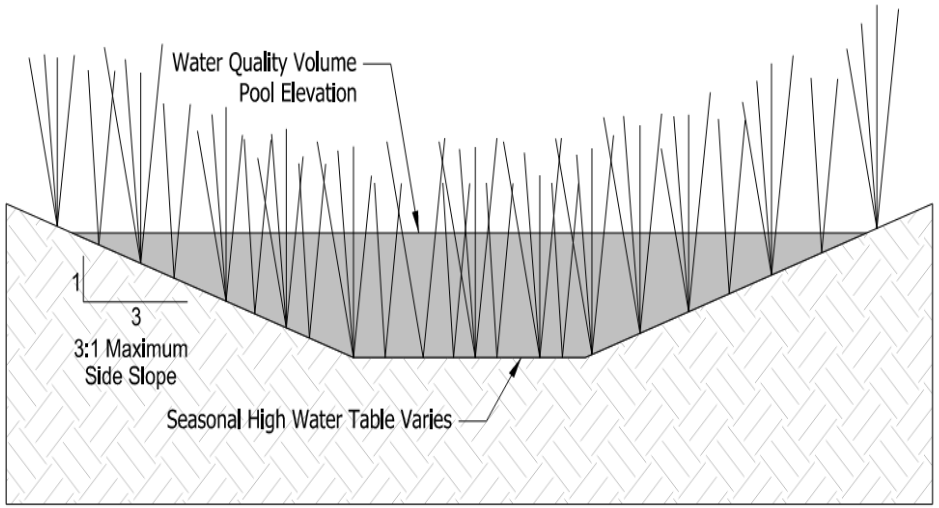
Note: Design can be a combination of the two details above (culvert with perforated pipe in stone trench).

Wet Swales

- Natural or engineered
- High water table or poorly drained soils
- Permanently retain the Water Quality Volume
- Advantages – provide aquatic wildlife habitat, can require less linear space than a dry swale, can treat for other pollutants
- Disadvantages – water can be come stagnant, attract nuisance insects, vegetation requires proper pH levels



Profile View



Cross Section View

Wet Swale

Wet Swale along US 113 – Maryland DOT State Highway Administration

Wet Retention Ponds

- Can serve as peak flow mitigation PCSM along with water quality PCSM
- Promotes settling of TSS and biological uptake of suspended pollutants
- Design to permanently store the Water Quality Volume
- Outlet structure and emergency spillway are required

- Advantages –
  - Provide aquatic wildlife habitat
  - Can reduce velocities in downstream receiving water body
  - Can treat for other pollutants
- Disadvantages
  - Water can be come stagnant
  - Attract nuisance insects
  - Vegetation requires proper pH levels
  - Require more maintenance compared to some PCSMs
  - Larger footprint required

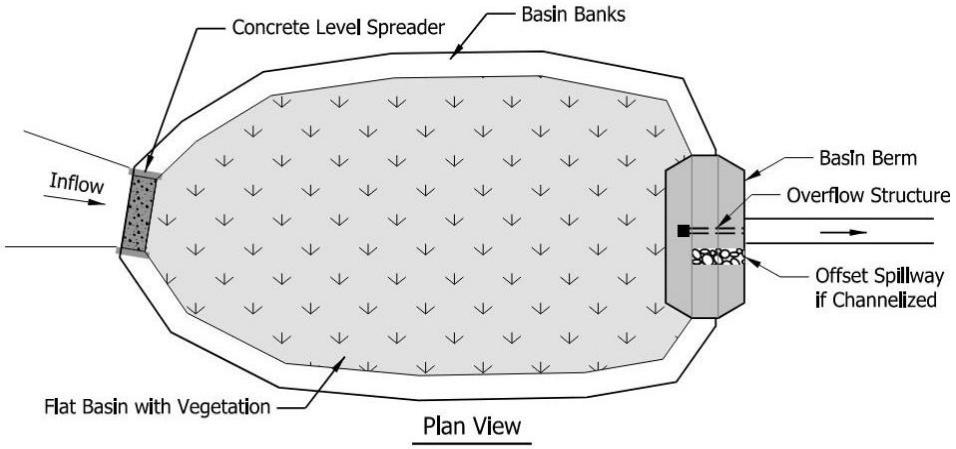
Wet Retention Pond Example

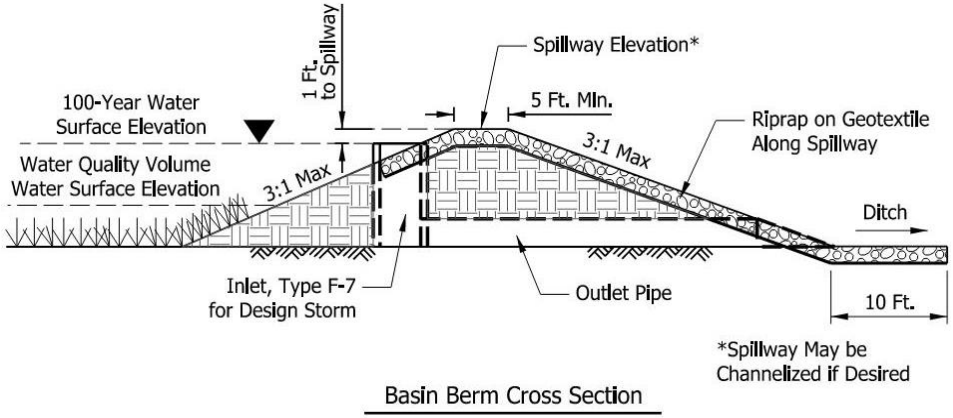
Wet Pond along MD 291– Maryland DOT State Highway Administration

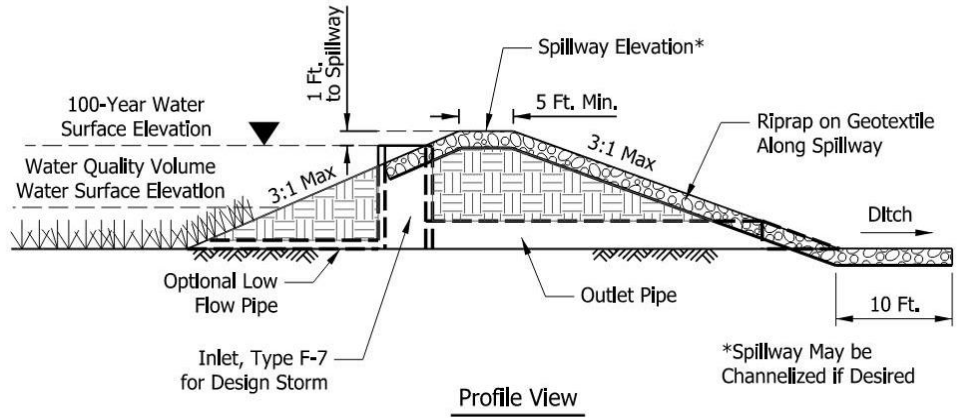
Infiltration

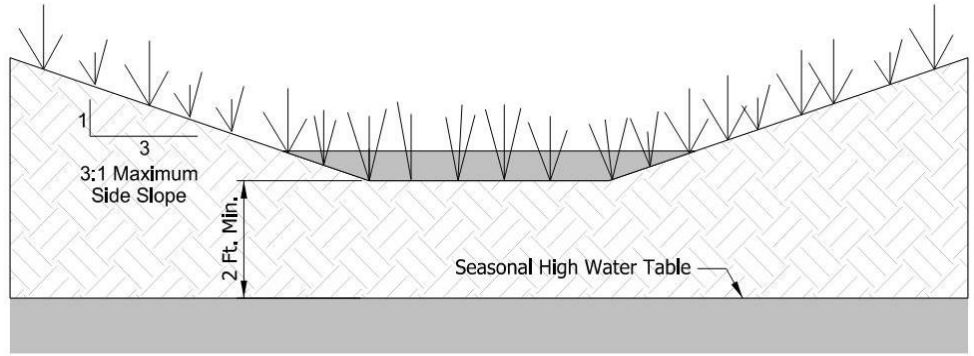
- Can be a swale or a basin
- Collect run-off and allow it to drain through the underlying soil
- Dependent on the existing underlying soil – soil testing required per guidelines provided in IDM Chapter 203
- Can be used to meet water quantity and water quality goals
- Designed to infiltrate the Water Quality Volume
- If used for peak flow mitigation, a computer model will be submitted per requirements in IDM Chapter 203
- If used for Water Quality only, equations can be used to calculate volume infiltrated and time to drain (provided in IDM Chapter 204)
- Demonstrate the Water Quality Volume is infiltrated

Infiltration Basin and Swale Details









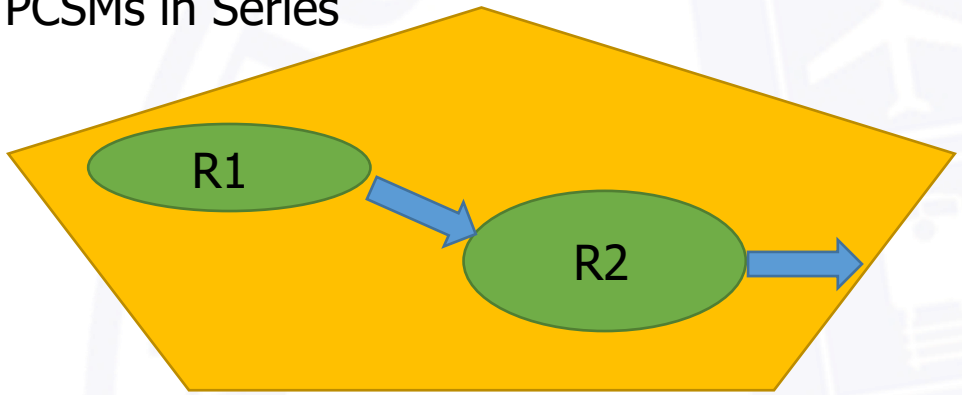
Hydrodynamic Separators

- Proprietary post-construction PCSM device
  - Many other types available, Hydrodynamic Separators preferred for INDOT projects
- Flow-through device
- Use a swirl or vortex to remove solids and trash via gravity from run-off
- Relatively small footprint
- Maintenance is critical – frequent inspection and cleanout required
  - Must consider future access in design

- Design Criteria
  - 80% TSS Removal and Floatables
  - Treatment train may be required to achieve desired pollutant removal
  - Contact PCSM@indot.IN.gov for preferred units list

PCSMs in Series or with Multiple Discharge Points

PCSMs in Series



$$R_t = R_1 + R_2 - \frac{R_1 * R_2}{100}$$

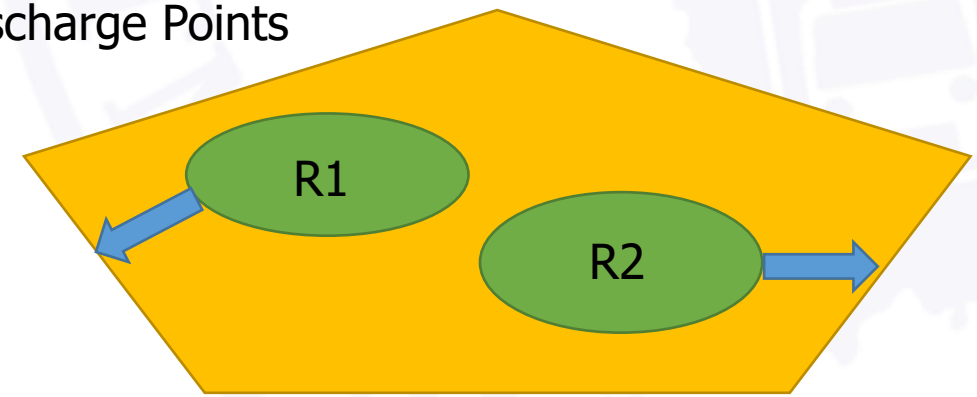
Where:

R_t = Total TSS Removal Rate, %

R_1 = TSS Removal Rate of the First or Upstream measure, %

R_2 = TSS Removal Rate of the Second or Downstream measure, %

Sites with Multiple Discharge Points



$$R_{avg} = \frac{(A_1 * R_1) + (A_2 * R_2)}{A_1 + A_2}$$

Where:

R_{avg} = Average TSS Removal Rate, %

R_1 = TSS Removal Rate of the First Onsite Area, %

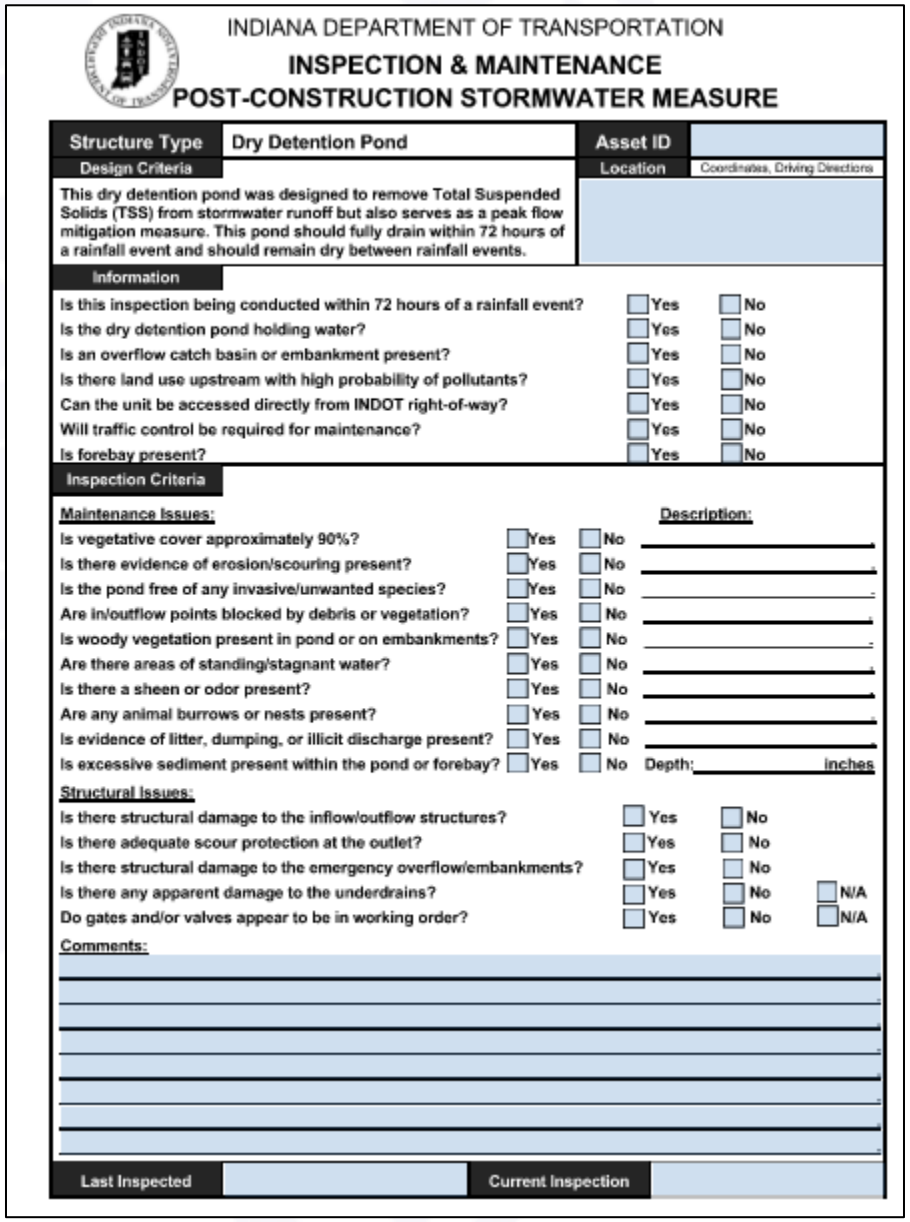
R_2 = TSS Removal Rate of the Second Onsite Area, %

A_1 = First Onsite Area, acres

A_2 = Second Onsite Area, acres

Inspection and Maintenance

- Measures added to asset list during final construction review
- Given an asset ID number and added to inspection schedule
- Maintenance as needed based on inspection
- Editable maintenance plan templates
- Inspection – 100% of all measures within five-year permit cycle
  - Frequency varies based on PCSM type
- Access for inspection and maintenance very important



INDIANA DEPARTMENT OF TRANSPORTATION

INSPECTION & MAINTENANCE
POST-CONSTRUCTION STORMWATER MEASURE

Structure Type	Dry Detention Pond	Asset ID	
Design Criteria		Location	Coordinates, Driving Directions

This dry detention pond was designed to remove Total Suspended Solids (TSS) from stormwater runoff but also serves as a peak flow mitigation measure. This pond should fully drain within 72 hours of a rainfall event and should remain dry between rainfall events.

Information

Is this inspection being conducted within 72 hours of a rainfall event?	Yes	No
Is the dry detention pond holding water?	Yes	No
Is an overflow catch basin or embankment present?	Yes	No
Is there land use upstream with high probability of pollutants?	Yes	No
Can the unit be accessed directly from INDOT right-of-way?	Yes	No
Will traffic control be required for maintenance?	Yes	No
Is forebay present?	Yes	No

Inspection Criteria

Maintenance Issues:

			Description:
Is vegetative cover approximately 90%?	Yes	No	
Is there evidence of erosion/scouring present?	Yes	No	
Is the pond free of any invasive/unwanted species?	Yes	No	
Are in/outflow points blocked by debris or vegetation?	Yes	No	
Is woody vegetation present in pond or on embankments?	Yes	No	
Are there areas of standing/stagnant water?	Yes	No	
Is there a sheen or odor present?	Yes	No	
Are any animal burrows or nests present?	Yes	No	
Is evidence of litter, dumping, or illicit discharge present?	Yes	No	
Is excessive sediment present within the pond or forebay?	Yes	No	Depth: _____ inches

Structural Issues:

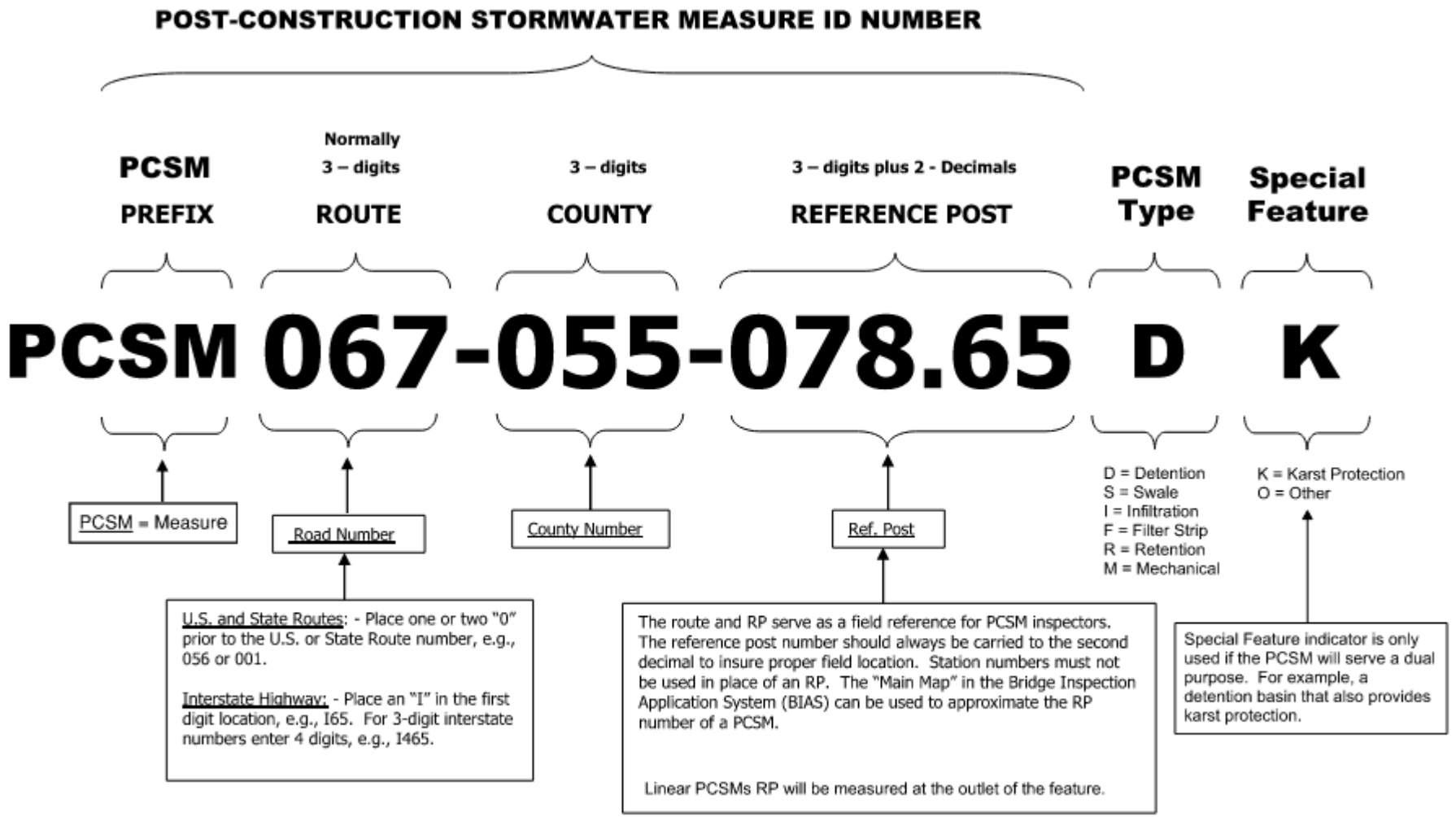
Is there structural damage to the inflow/outflow structures?	Yes	No	
Is there adequate scour protection at the outlet?	Yes	No	
Is there structural damage to the emergency overflow/embankments?	Yes	No	
Is there any apparent damage to the underdrains?	Yes	No	N/A
Do gates and/or valves appear to be in working order?	Yes	No	N/A

Comments:

Last Inspected		Current Inspection	

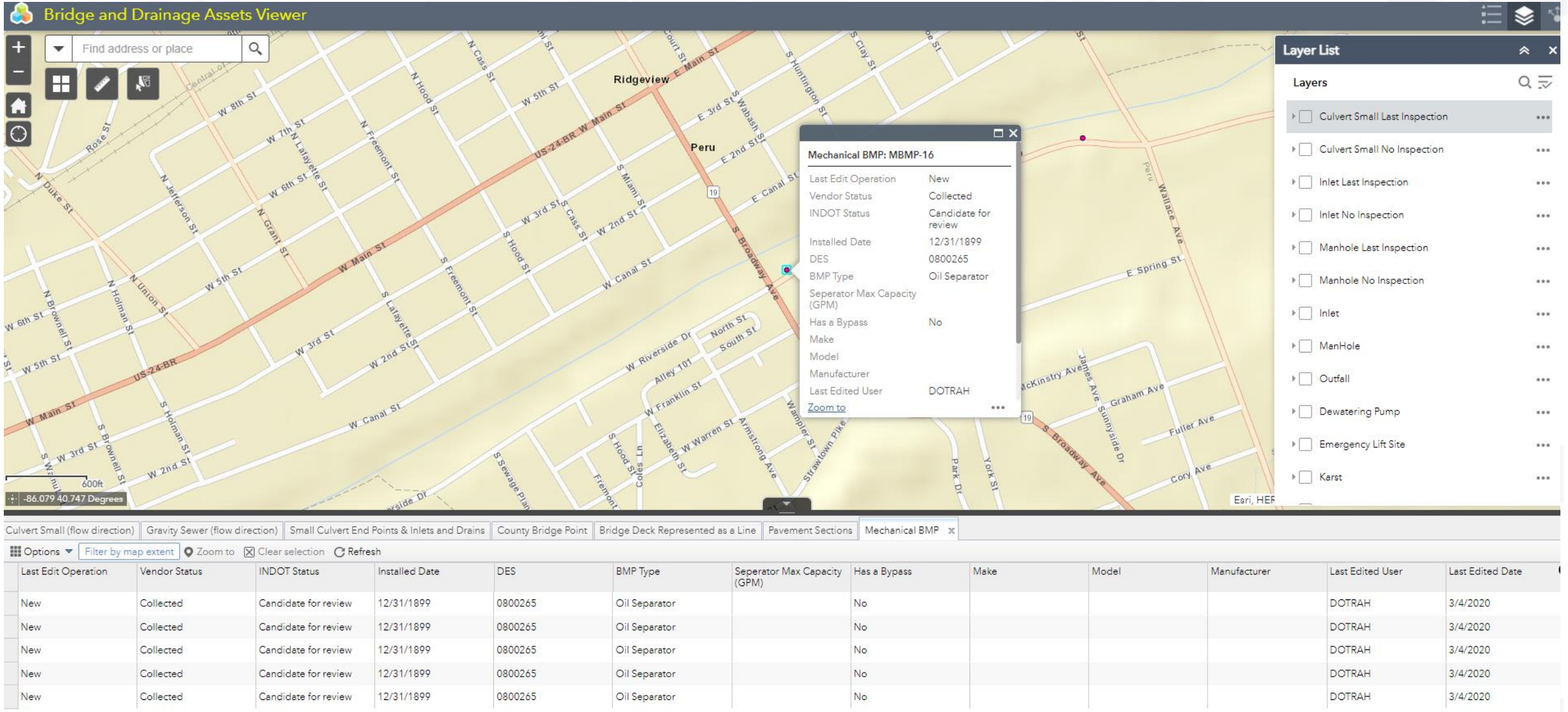
NextLevel INDIANA

PCSM Naming Convention



Contact PCSM@indot.IN.gov for questions regarding PCSM asset ID numbers

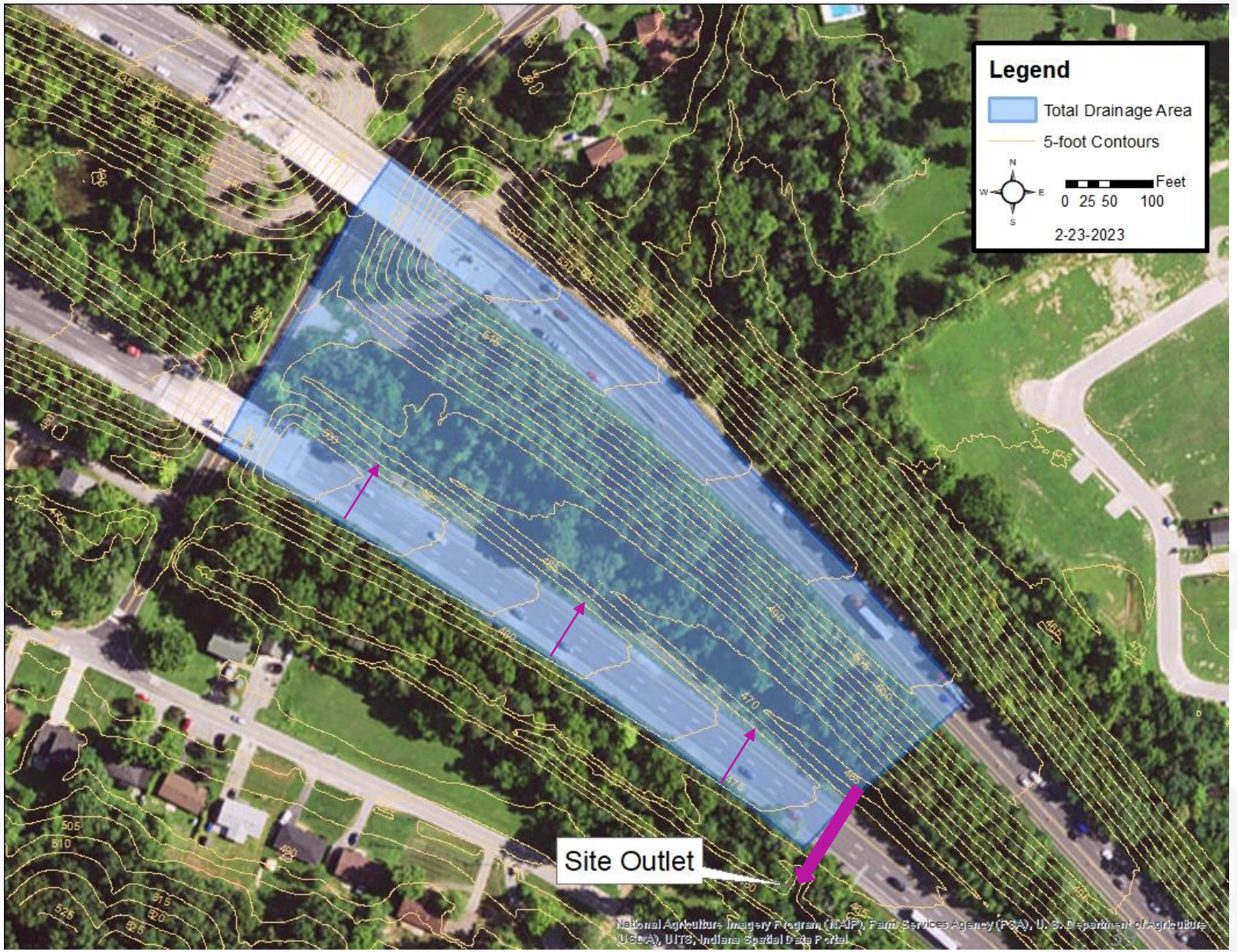
Bridge and Drainage Assets Viewer



Last Edit Operation	Vendor Status	INDOT Status	Installed Date	DES	BMP Type	Seperator Max Capacity (GPM)	Has a Bypass	Make	Model	Manufacturer	Last Edited User	Last Edited Date
New	Collected	Candidate for review	12/31/1899	0800265	Oil Separator		No				DOTRAH	3/4/2020
New	Collected	Candidate for review	12/31/1899	0800265	Oil Separator		No				DOTRAH	3/4/2020
New	Collected	Candidate for review	12/31/1899	0800265	Oil Separator		No				DOTRAH	3/4/2020
New	Collected	Candidate for review	12/31/1899	0800265	Oil Separator		No				DOTRAH	3/4/2020
New	Collected	Candidate for review	12/31/1899	0800265	Oil Separator		No				DOTRAH	3/4/2020

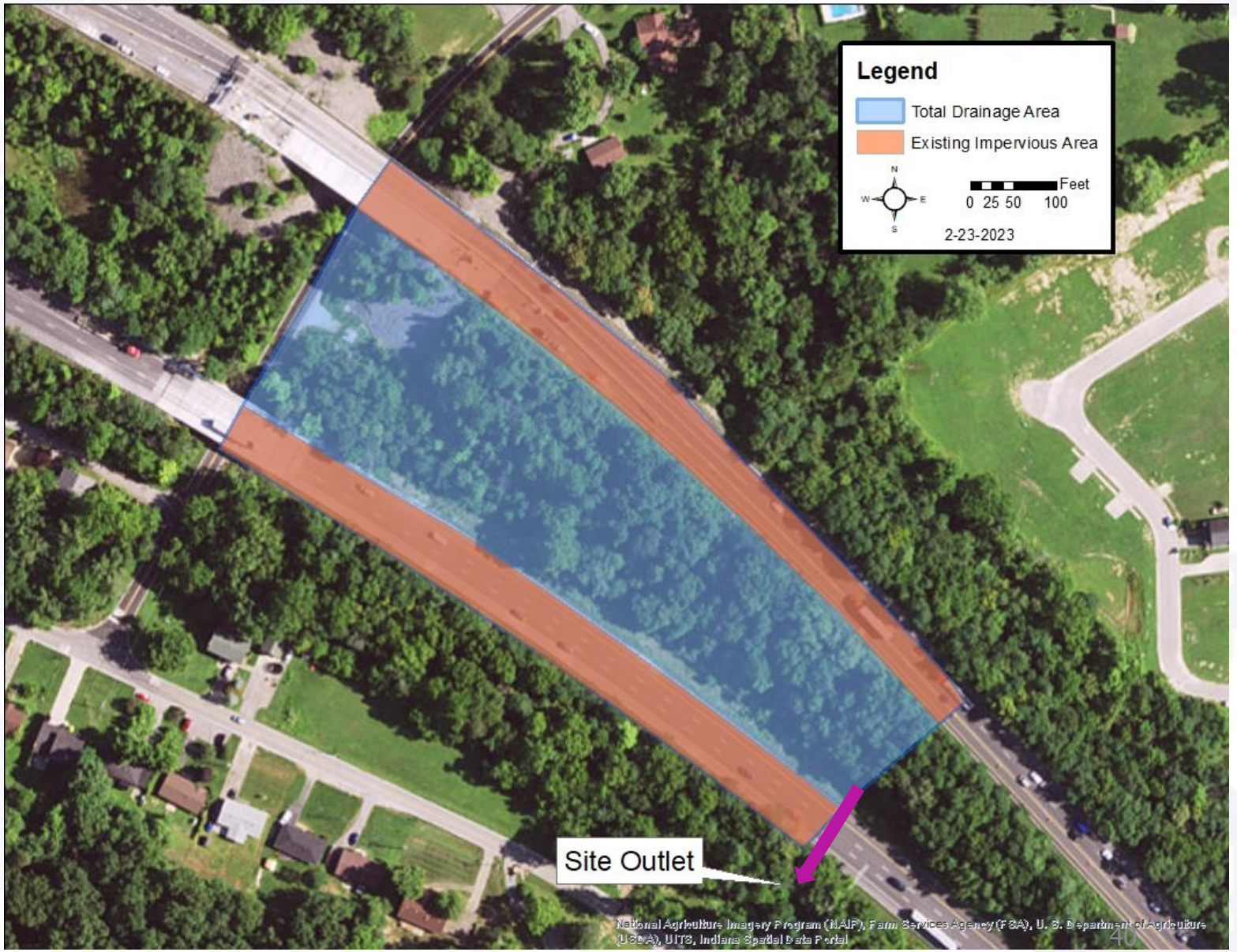
Water Quality Volume Example (1 of 4)

- Determine site outlet
- Delineate drainage area (acres)
  - Use LiDAR for offsite area and survey data for onsite area
  - Account for existing drainage features such as storm sewer



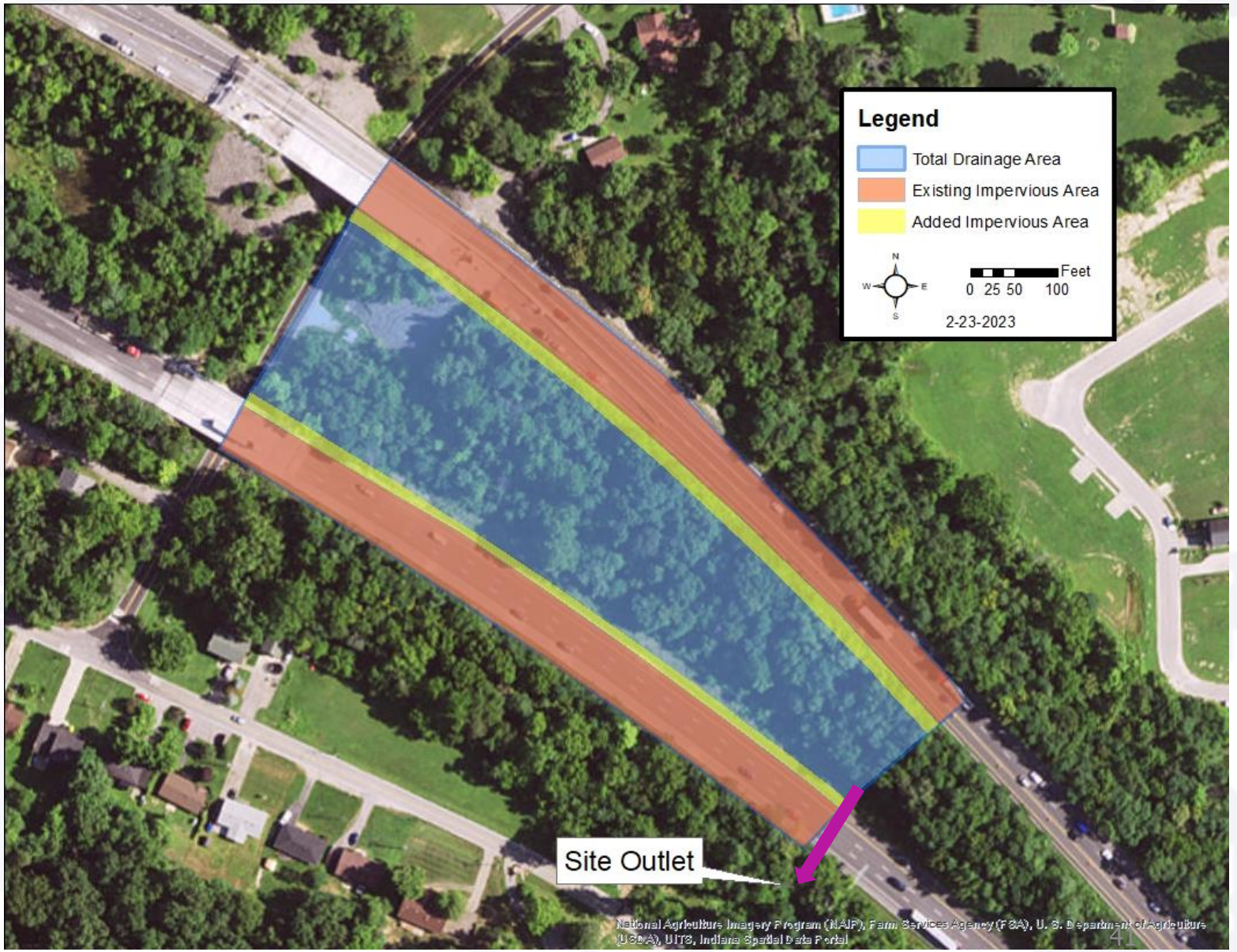
Water Quality Volume Example (2 of 4)

- Determine existing onsite impervious area
  - Include all surfaces, not just the roadway



Water Quality Volume Example (3 of 4)

- Determine added onsite impervious area
  - Include all surfaces, not just the roadway



Water Quality Volume (4 of 4)

Water Quality Volume Calculation Template

Cells shaded in grey will auto-populate, designer is responsible for checking results.

$$WQ_v = \frac{(P * R_v * A)}{12}$$

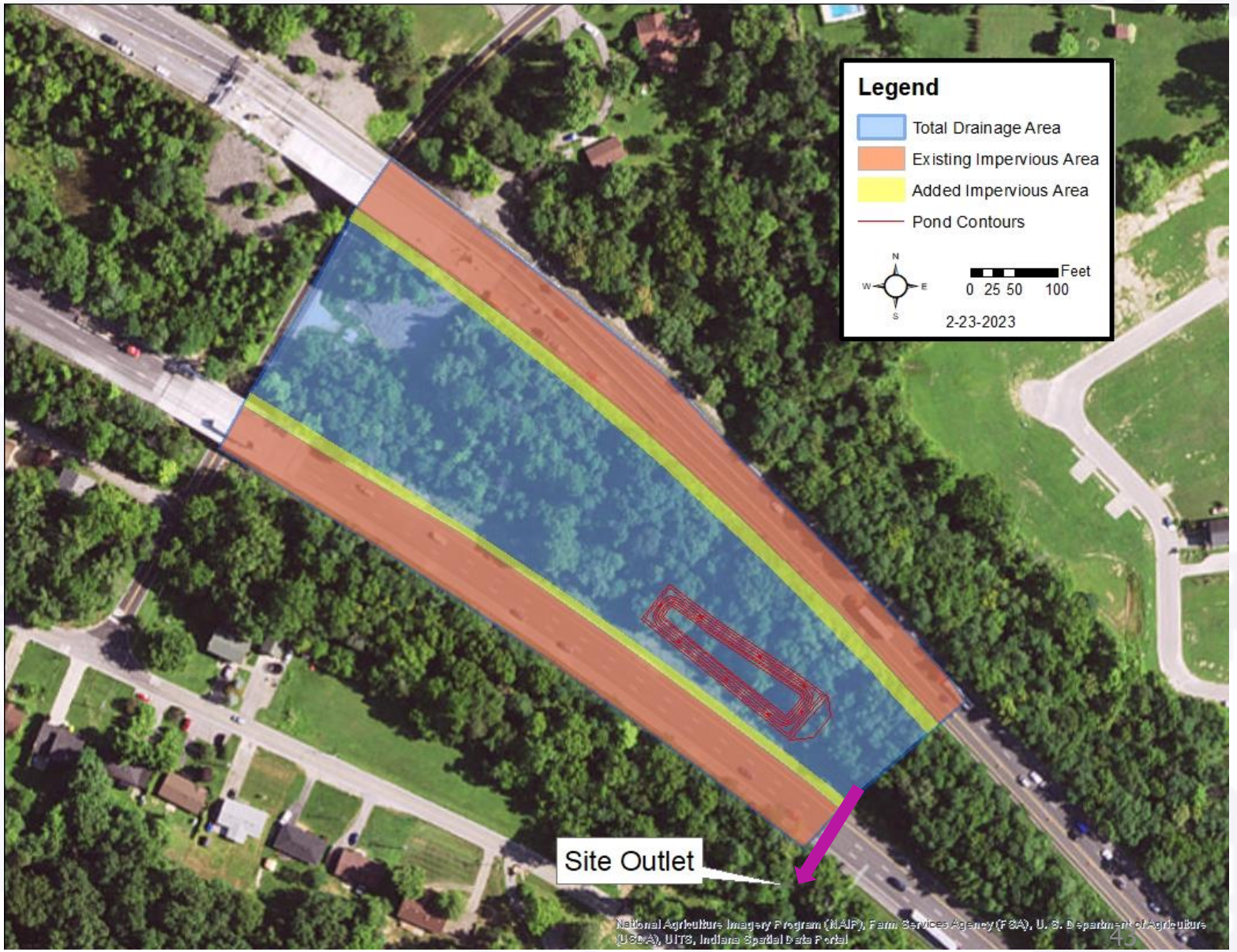
$$R_v = 0.05 + (0.009 * I)$$

$$I = \frac{P_{ia} - E_{ia}}{A} * 100$$

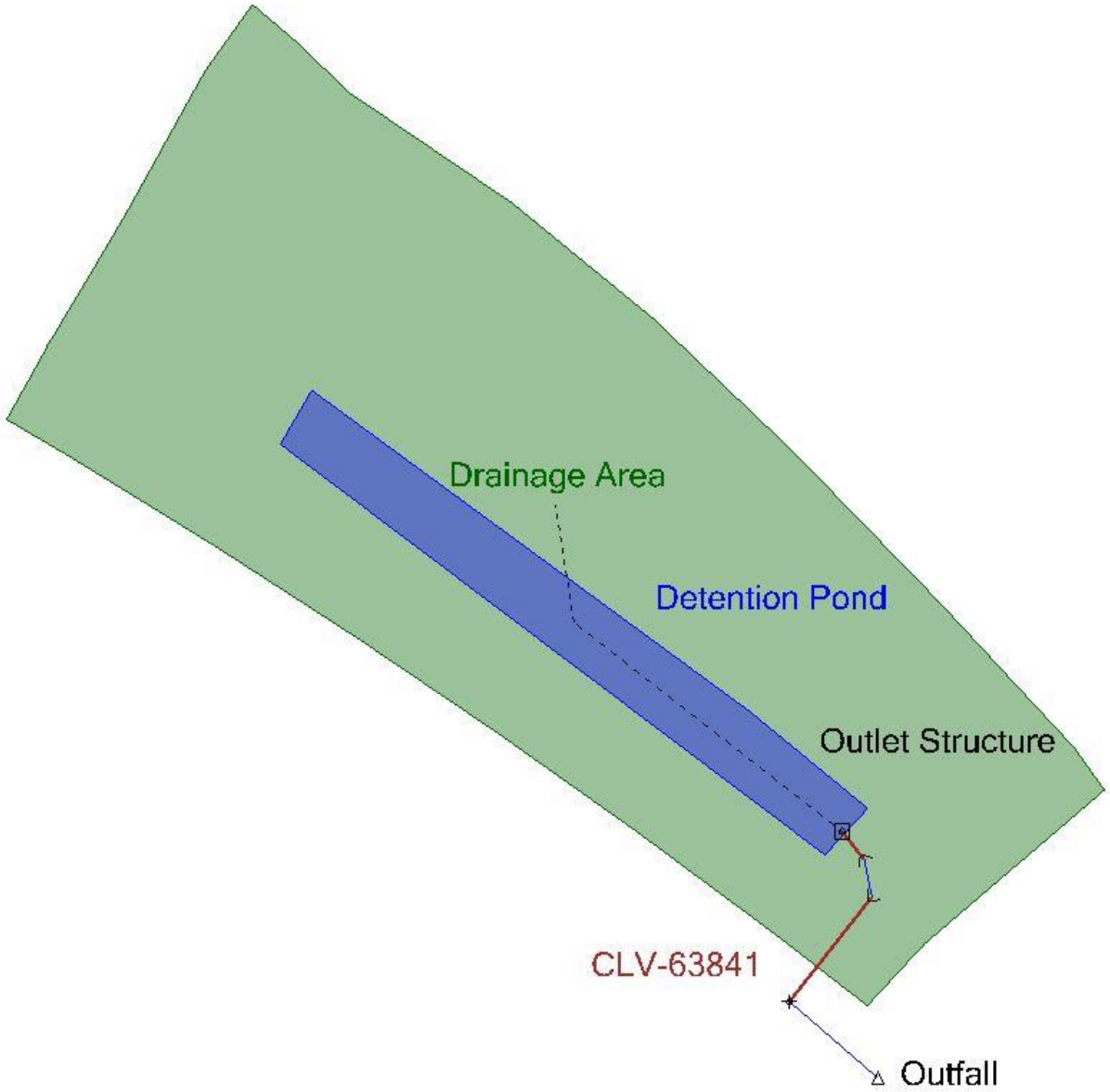
P_{ia}	2.8	Proposed Onsite Impervious Area, acres
E_{ia}	2.3	Existing Onsite Impervious Area, acres
A	6.6	Total Proposed Onsite Drainage Area, acres
I	8.5	Percent New Impervious Cover, %
R_v	0.1	Volumetric Run-off Coefficient
WQ_v	0.07	Water Quality Volume, acre-ft
WQ_v	3020	Water Quality Volume, ft³

Dry Detention Example (1 of 4)

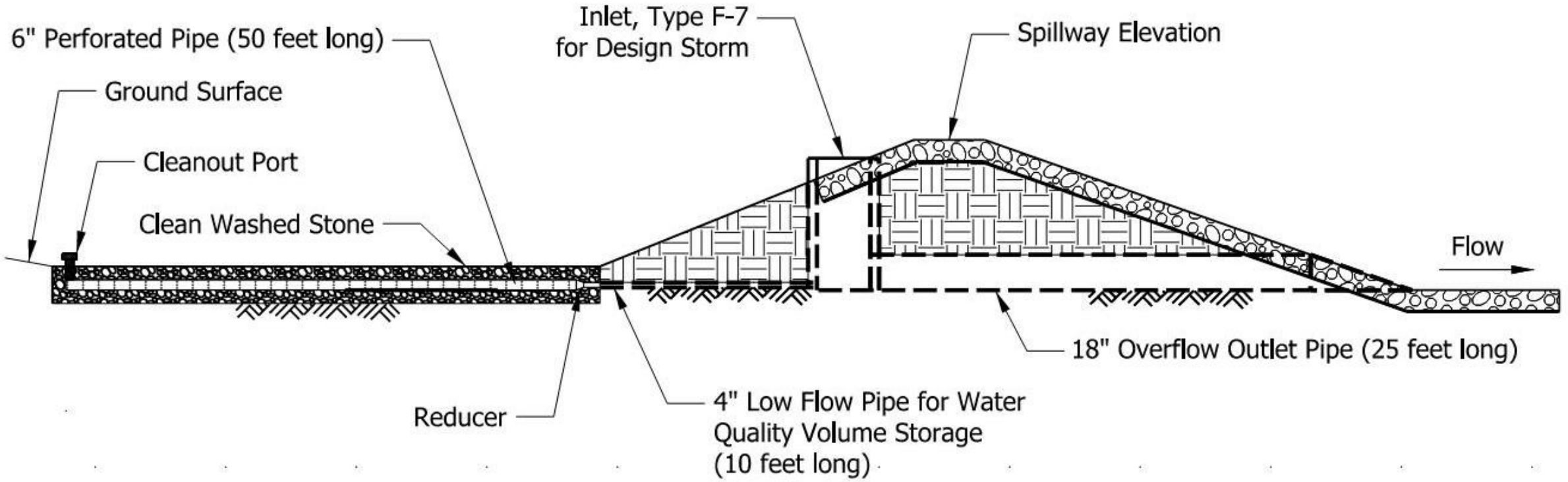
- Assumptions for this example
  - Detention is required for peak flow mitigation
  - Model was created following IDM Chapter 203 Requirements
  - All flow in this drainage area goes through the dry detention pond
  - Water Quality Volume = 3,020 cubic feet
  - Allowed to detain in median (normally not allowed)
- Criteria – detain WQv and release over 24hours



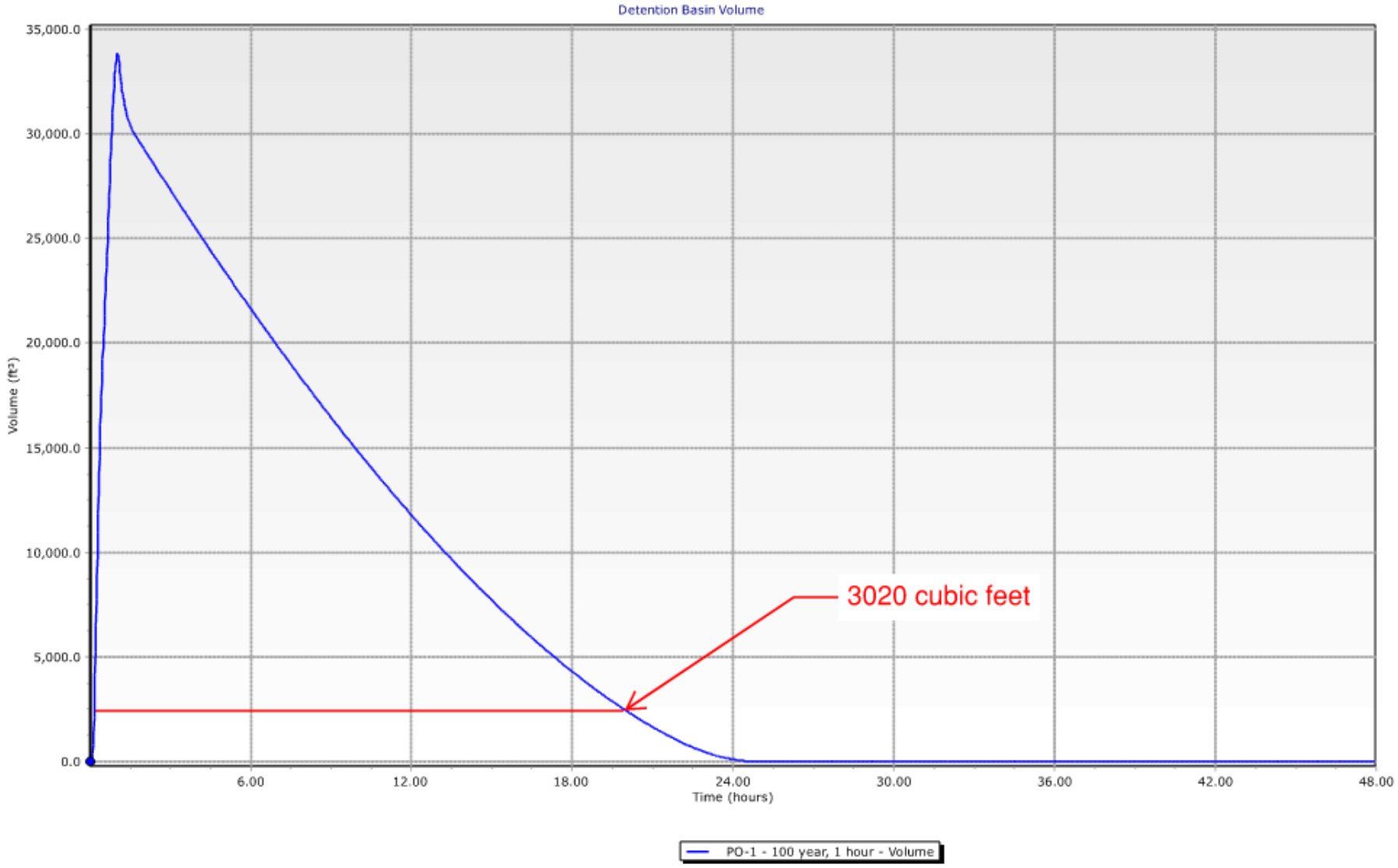
Dry Detention Example (2 of 4)



Dry Detention Example (3 of 4)

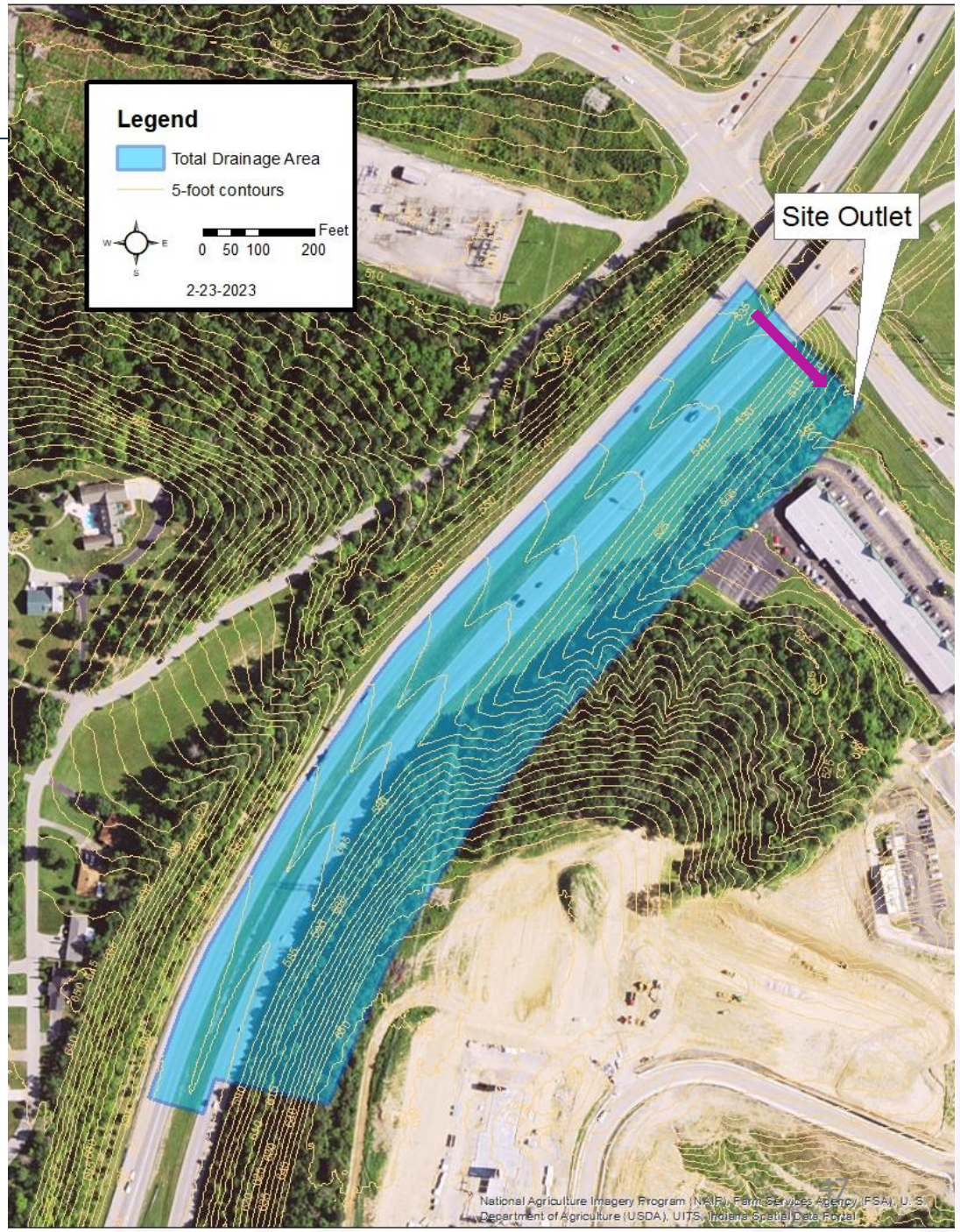


Dry Detention Example (4 of 4)

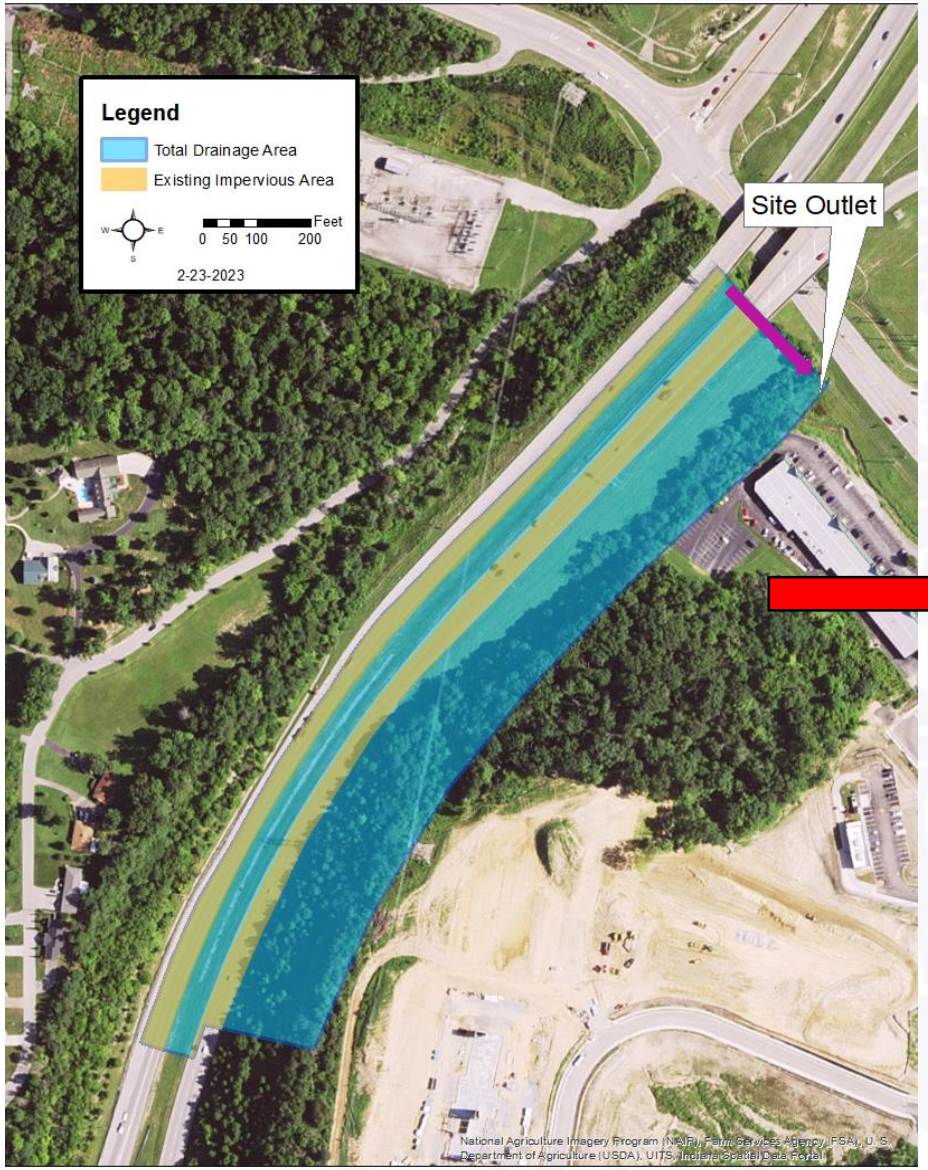


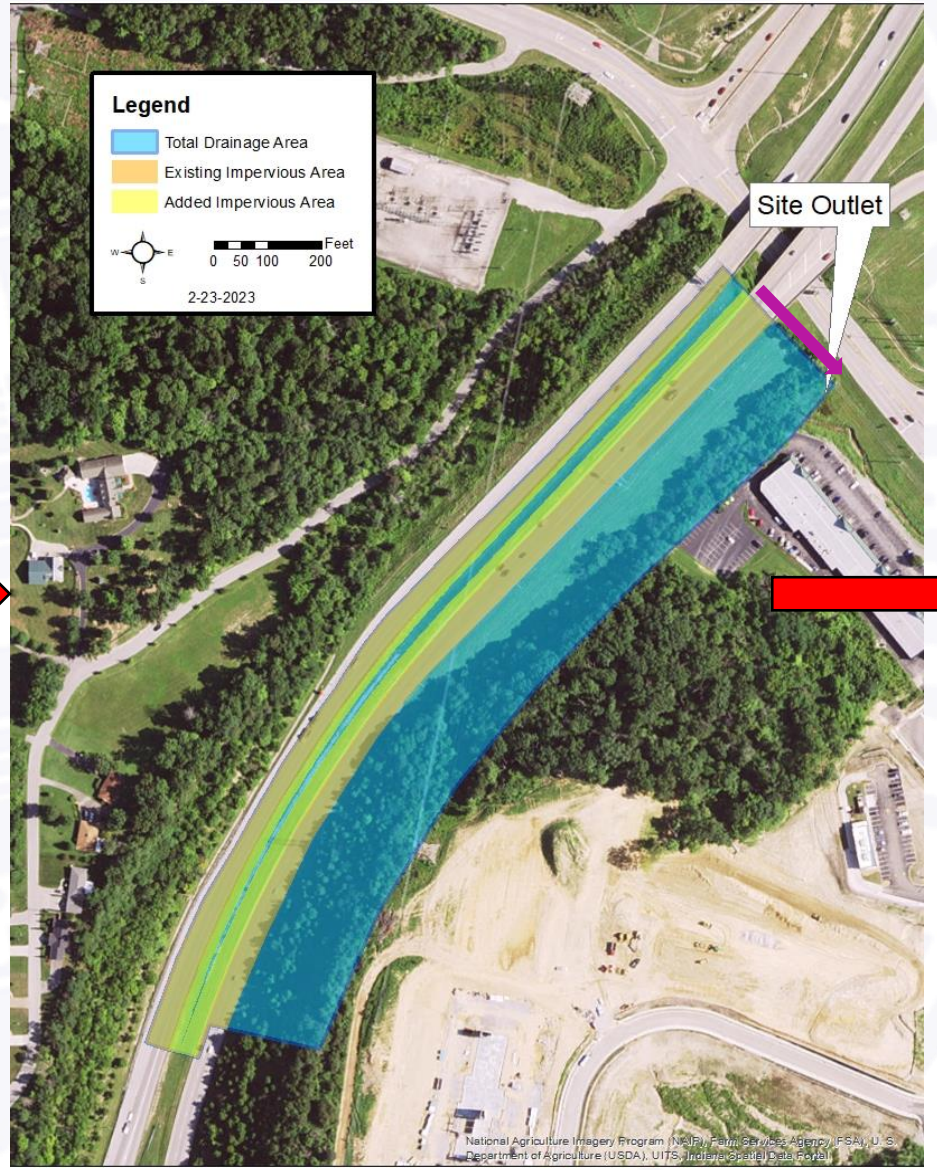
Dry Swale Example (1 of 6)

- Calculate Water Quality Volume
- Calculate Water Quality Treatment Rate
- Determine preliminary longitudinal slope
- Determine preliminary swale geometry
- Determine preliminary vegetation type (native or turf)
- Analyze swale using Manning's Equations
- Determine Hydraulic Residence Time
  - Target – 9 minutes for 80% TSS Removal



Dry Swale Example (2 of 6)



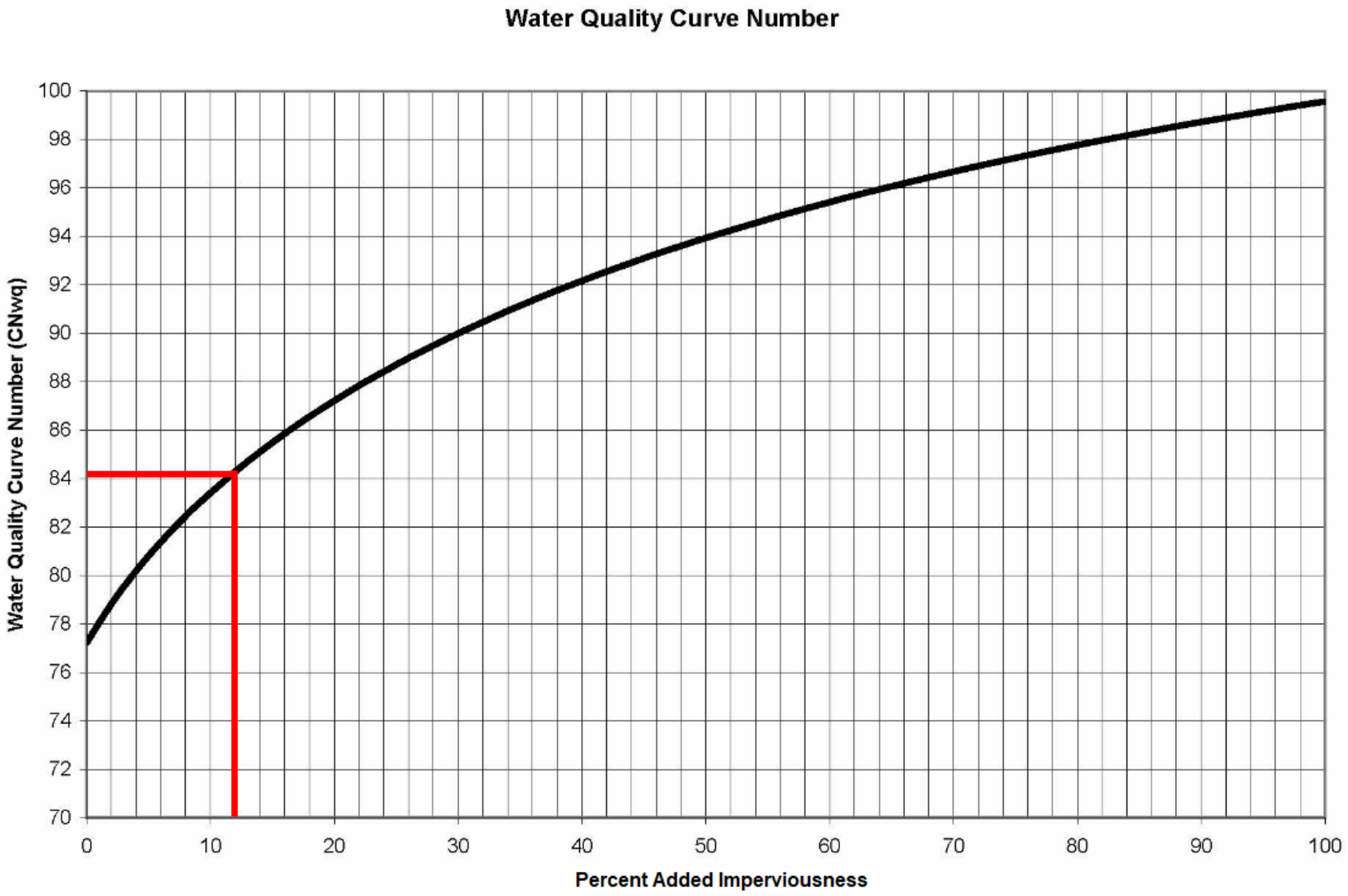


Existing Impervious Area = 3.3 acres

Proposed Impervious Area = 4.8 acres

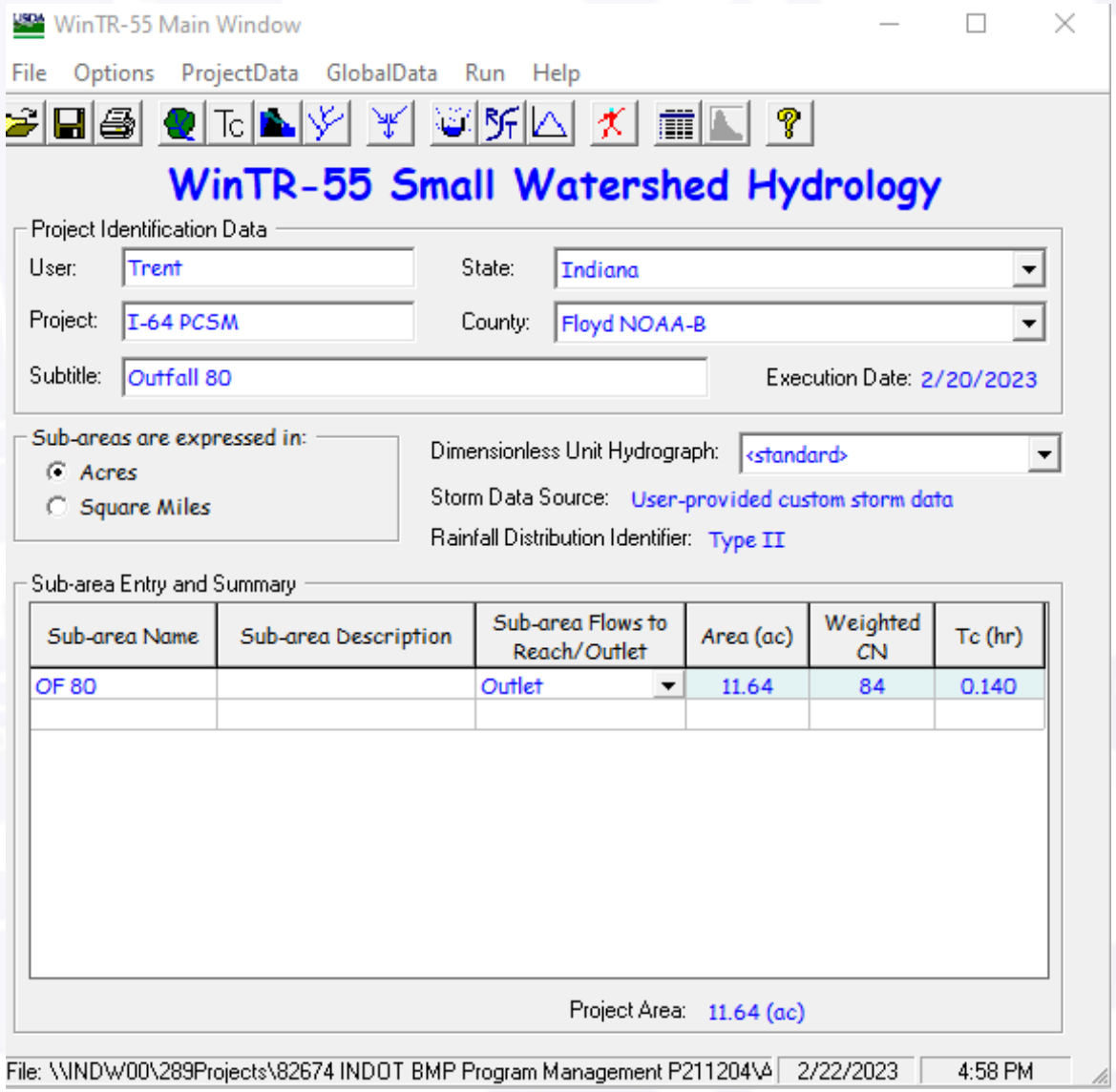
% Added Impervious = 12%

Dry Swale Example (3 of 6)

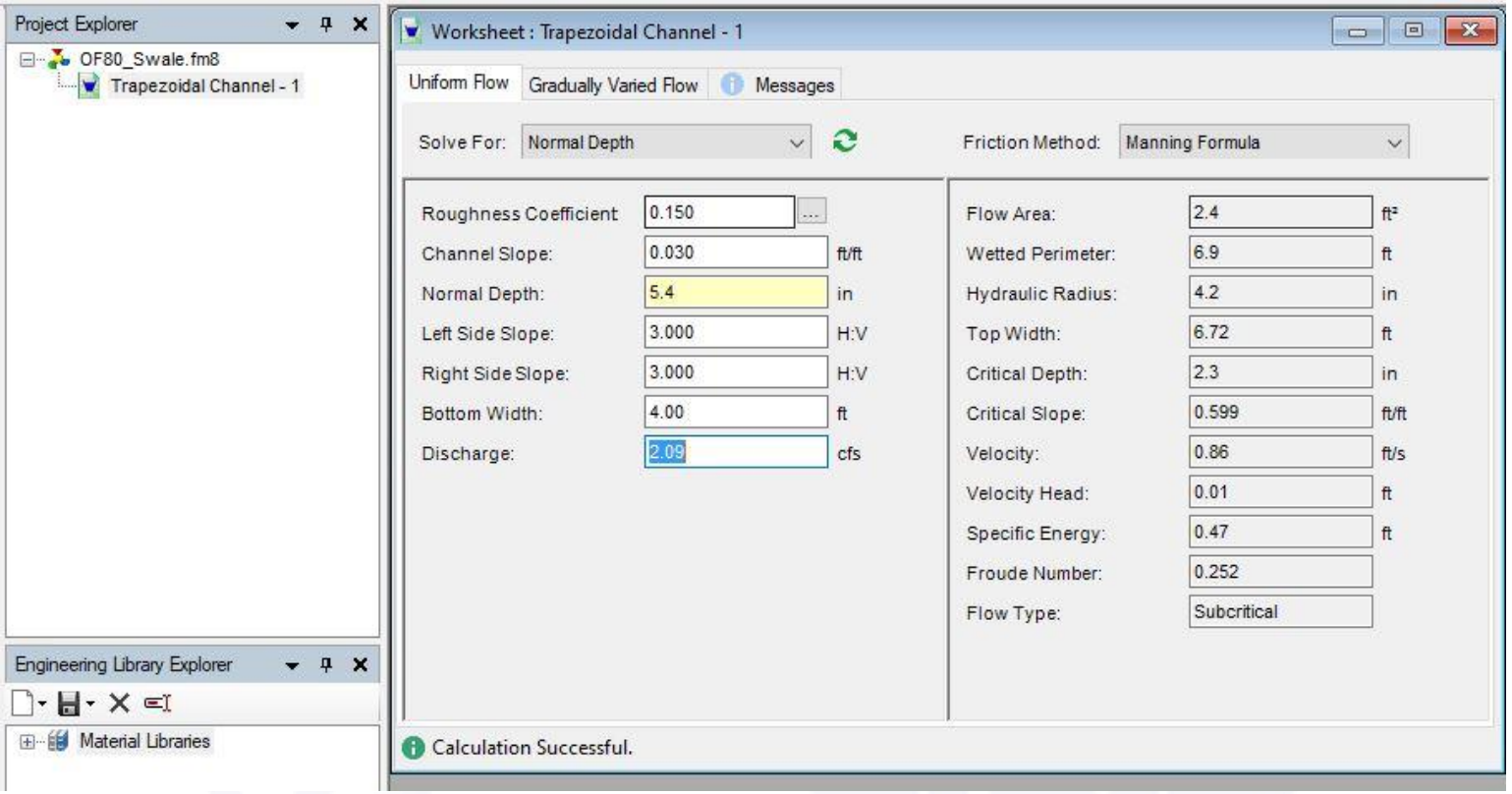


Dry Swale Example (4 of 6)

- CNwq = 84
- Tc = 0.14 hours (obtained using TR-55 Methodology)
- Total onsite area = 11.6 acres
- NRCS Type II rainfall distribution
  - Depth of rainfall = 1 inch
- NRCS Methodology
- <u>Qwq = 2 cfs</u>



Dry Swale Example (5 of 6)



- Qwq = 2 cfs
- Length of Swale = 475 feet
- Longitudinal Slope = 0.03 ft/ft
- Bottom Width = 4 feet
- Slide Slopes = 3:1
- Manning's n = 0.15
- Depth of flow in channel = 5.4 inches
- Vegetation = Turf Grass
- Vwq = 0.86 ft/s

Dry Swale Example (6 of 6)

Hydraulic Residence Time

Cells shaded in grey will auto-populate, designer is responsible for checking results.

$$T_{ahr} = \frac{(L_{swale}/v_{wq})}{60}$$

L_{swale}	475	Length of swale, feet
v_{wq}	0.86	Peak flow velocity at water quality event, ft/s
T_{ahr}	9.2	Hydraulic residence time, minutes

PCSM Submittal Requirements (1 of 5)

- With Stage 1 Review Submission (25% Design)
  - Stormwater Outfalls (locations where stormwater leaves INDOT right-of-way) identified in plans with approximate added pavement values listed (acres or square feet)
  - Preliminary locations of proposed Post-construction Stormwater Measures (PCSMs) identified and labeled in plans
    - Use naming convention provided on Environmental Services Division Stormwater webpage
    - List type of PCSM (for example: PCSM 067-055-078.65 S)
    - PCSMs included in cost estimate
  - Design calculations for PCSMs are not required with Stage 1 Submittal

PCSM Submittal Requirements (2 of 5)

- With Stage 2 Review Submission (55% Design)
  - Stormwater Outfalls (locations where stormwater leaves INDOT right-of-way) identified in plans with approximate added pavement values listed (acres or square feet)
  - Preliminary locations of proposed PCSMs identified and labeled in plans
    - Use naming convention provided on Environmental Services Division Stormwater webpage
    - List type of PCSM (for example: PCSM 067-055-078.65 S)
  - PCSMs included in cost estimate
  - Design calculations for PCSMs are not required with Stage 2 Submittal

PCSM Submittal Requirements (3 of 5)

- 90 Days After Stage 2 Review Submission (Target)
  - Post-construction Stormwater Measures Design Report including
    - Narrative
    - Project Location Map
    - Outfall Locations Map
    - Existing and proposed drainage area delineations for each outfall
    - Must include existing contours with labels and proposed contours with labels, respectively
    - NRCS Soils information
    - Percolation testing results if using infiltration measure(s)
    - Water Quality Volume calculations for each outfall
    - Water Quality Treatment rate calculations or model output for flow through PCSM sizing
    - All supporting calculations for proposed PCSMs, including computer models
    - Signed and sealed by a professional engineer licensed in Indiana
  - PCSM Detail Sheets
  - Completed maintenance plans (see templates on Environmental Services Division Stormwater webpage)

PCSM Submittal Requirements (4 of 5)

- With Stage 3 Review Submission (95% Design) and/or Final Tracings Submission (100% Design)
  - Stormwater Outfalls (locations where stormwater leaves INDOT right-of-way) identified in plans with approximate added pavement values listed (acres or square feet)
  - Locations of proposed PCSMs identified and labeled in plans
    - Use naming convention provided on Environmental Services Division Stormwater webpage
    - List type of PCSM (for example: PCSM 067-055-078.65 S)
    - Plans will include locations of jurisdictional streams and wetlands
    - Plans will include design table for PCSMs, which will list proposed asset identification number, alignment, station, and offset. For linear PCSMs, list starting and ending station and offset.
    - PCSM Detail Sheets (until Reoccurring/Standard Drawings are available)
    - PCSM Unique Special Provisions (until Reoccurring Special Provisions are available)
  - Completed maintenance plans (see templates on Environmental Services Division Stormwater webpage)
  - PCSMs included in cost estimate
  - PCSM Approval Memo

PCSM Submittal Requirements (5 of 5)

- With SWPPP (as an Appendix)
  - Stormwater Outfalls (locations where stormwater leaves INDOT right-of-way) identified in plans with approximate added pavement values listed (acres or square feet)
  - Locations of proposed PCSMs identified and labeled in plans
    - Use naming convention provided on Environmental Services Division Stormwater webpage
    - List type of PCSM (for example: PCSM 067-055-078.65 S)
    - Plans will include locations of jurisdictional streams and wetlands
    - Plans will include design table for PCSMs, which will list proposed asset identification number, alignment, station, and offset. For linear PCSMs, list starting and ending station and offset.
    - PCSM Detail Sheets (until Reoccurring/Standard Drawings are available)
    - PCSM Unique Special Provisions (until Reoccurring Special Provisions are available)
  - Completed maintenance plans (see templates on Environmental Services Division Stormwater webpage)
  - PCSM Approval Memo

How to Submit

- Typical ERMS Uploads for Plans Submittals
  - For Stage 2, 3, and Final Tracings, cc us in the ERMS Coordinator email (PCSM@indot.IN.gov) when a submittal is made (that includes PCSMs) until further direction is provided. State in transmittal letter PCSMs are included.
- For PCSM Report Submittal, email report to PCSM@indot.IN.gov
  - New upload location will be available in the future, look out for further guidance.
- PCSM Naming Convention
  - Report – PCSM Report DES XXXXXXX (Date) XX-XX-XXXX
    - For example: PCSM Report DES 1900162 2-23-2023
  - Models – PCSM (Model Name) DES XXXXXXX (Date) XX-XX-XXXX
    - For example: PCSM WinTR-55 DES 1900162 2-23-2023
  - Use this basic naming convention for other file types

Review Process

- Comment Form will be sent to designer via email as needed
  - INDOT PM will be cc'd, along with INDOT EWPO staff
  - PCSM Team review of plans is not part of the plan review process at this time; it is an independent and separate review
- Report Approval Memo will be sent once design and report are approved
- Coordination meetings may be required
  - Designers are encouraged to ask questions ahead of submittals and request meetings if needed
- PCSM Reports will not be scored at this time; however, INDOT PMs will be aware of number of resubmittals

Cost Estimates and Construction Specifications

- Reoccurring Special Provisions and Drawings are in the works
- For now, use traditional methods
  - USPs
  - Detail Sheets
  - Existing Pay Items
- PCSM Team can provide guidance if needed

Available Resources

- See Stormwater Webpage
  https://www.in.gov/indot/engineering/environmental-services/storm-water/
- Design Memorandum 22-22
- Post-construction Stormwater Measure Guidance
- Submittal Guidance
- PCSM Naming Guidance
- Hydraulic Residence Time Calculation Template
- Water Quality Volume Calculation Template
- Maintenance Plan Templates

Future Resources

- Reoccurring Special Provisions and Drawings
- Frequently Asked Questions
- Example Reports (submit a good one and yours's can be an example!)
- Don’t see what you need?
  - Consultant develops draft
  - HNTB review
  - Post on webpage
  - Available for others and updated
- Thank you for your help in advance!!!

Let’s get this party started!!!

Questions